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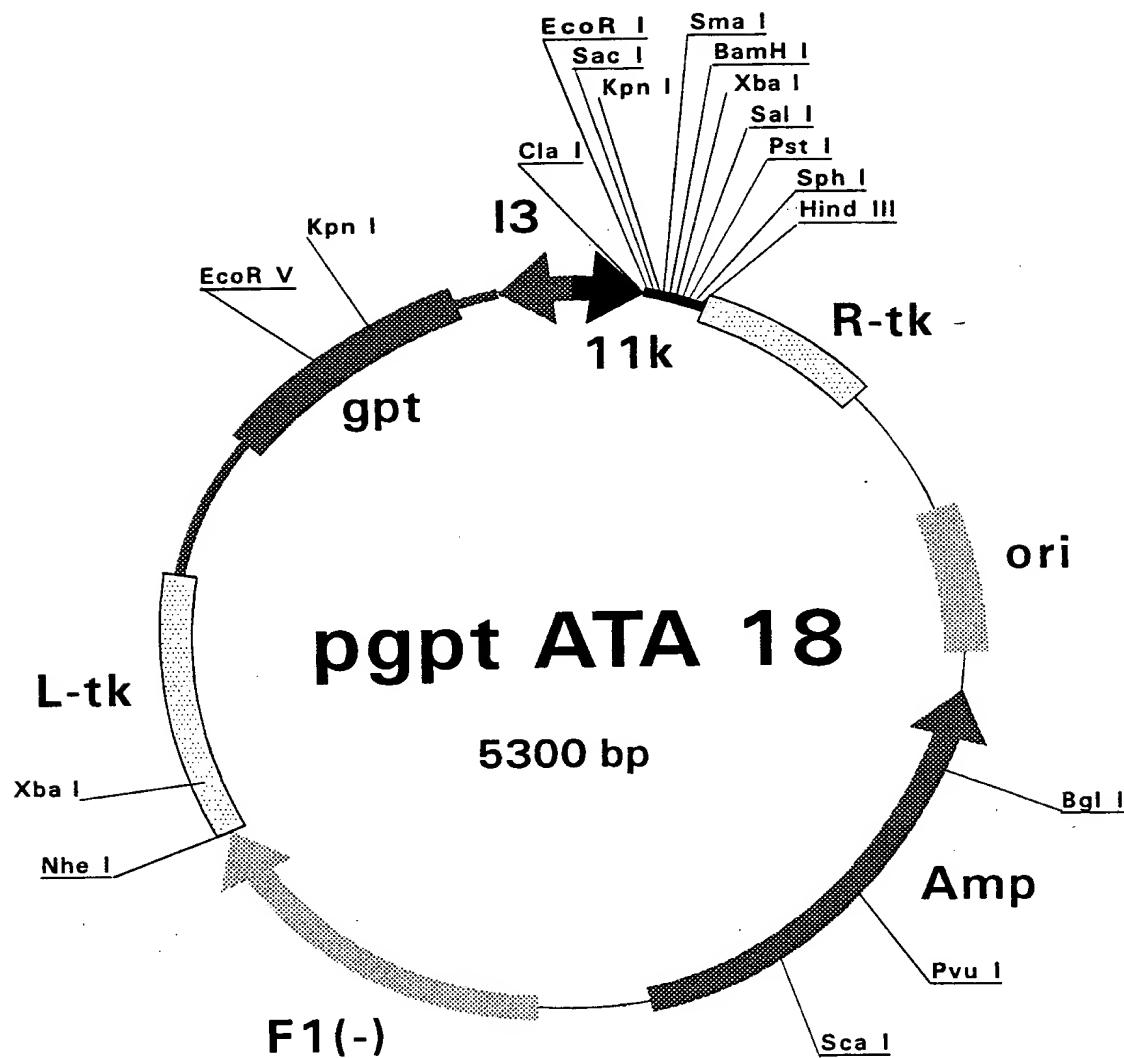
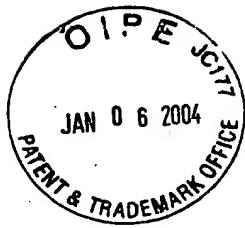


Fig. 1



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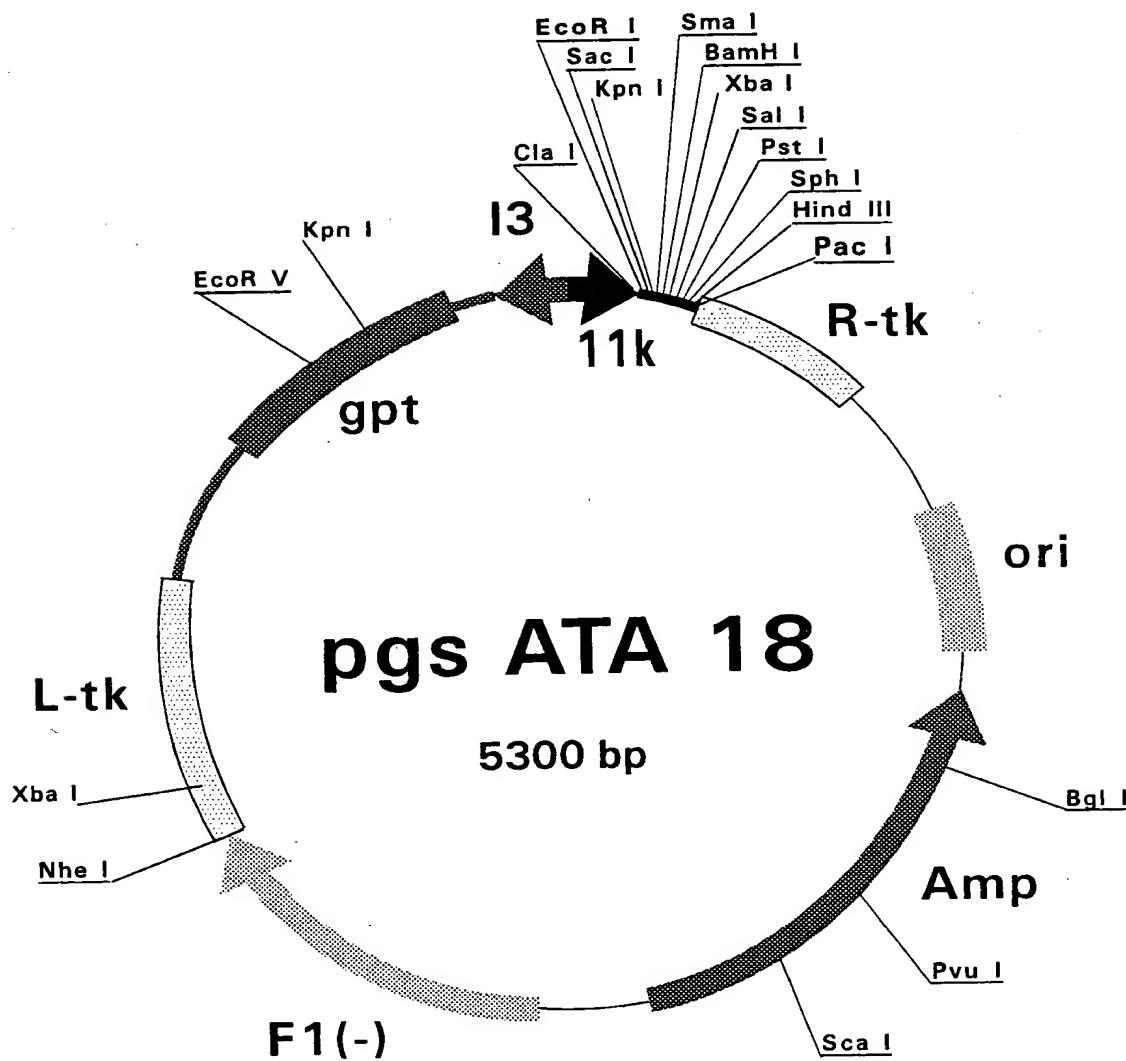


Fig. 2



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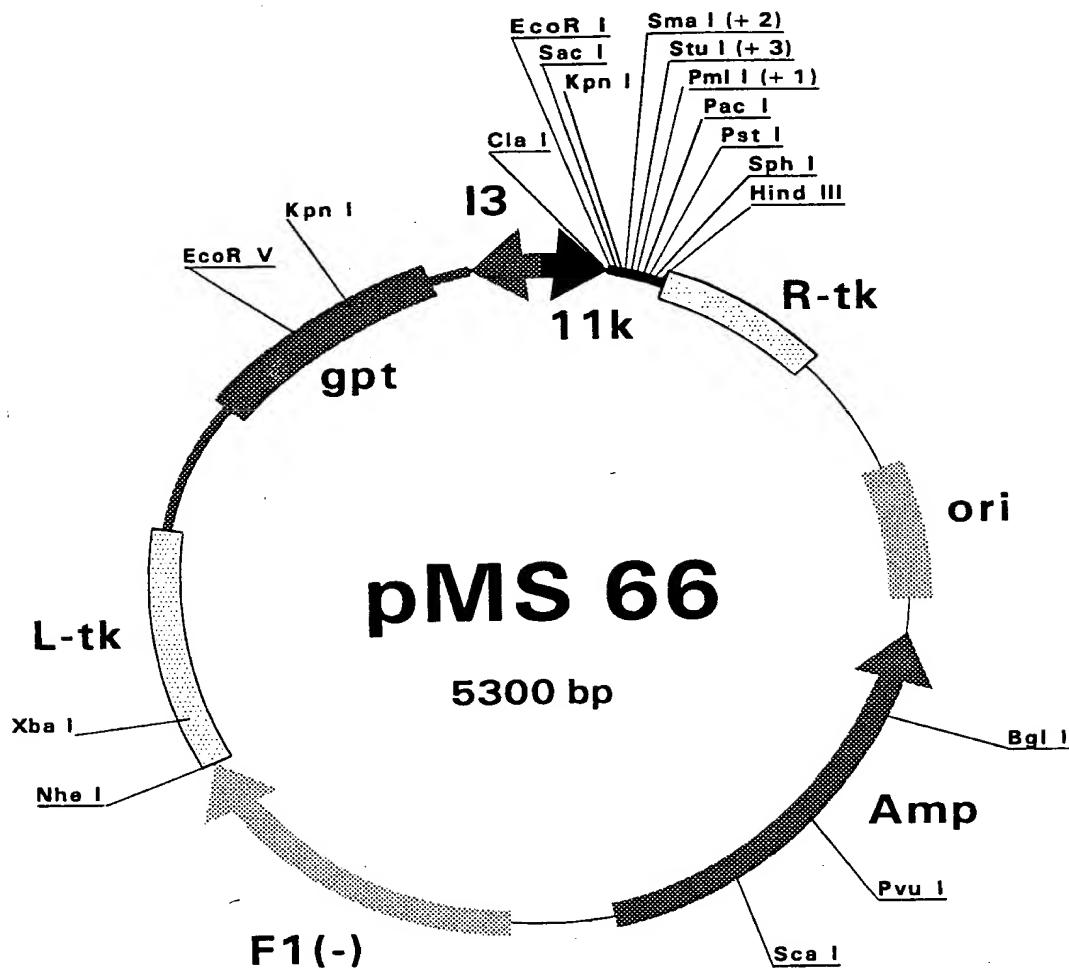


Fig. 3



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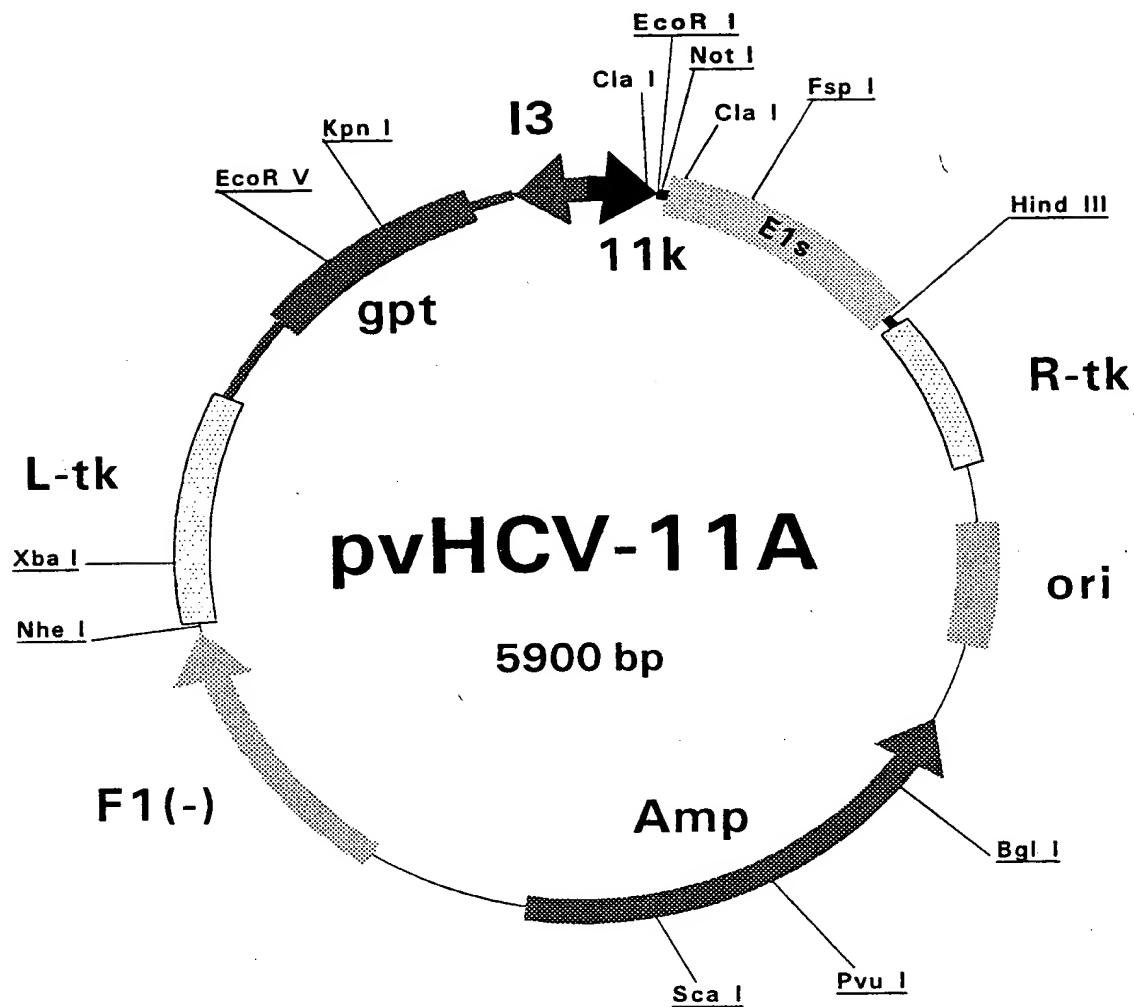


Fig. 4



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## Anti-E1 levels in NON-responders to IFN treatment

Series 1

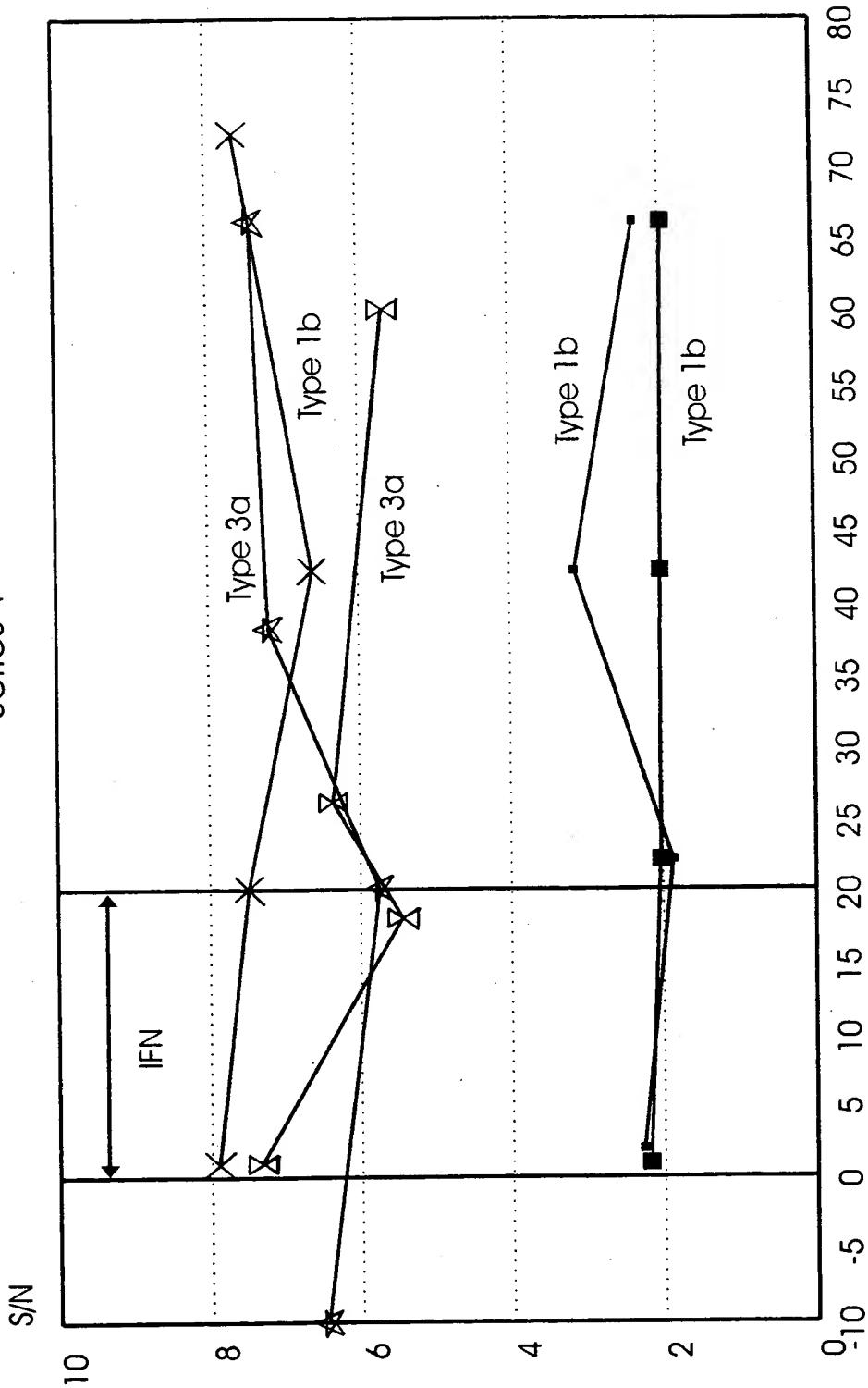


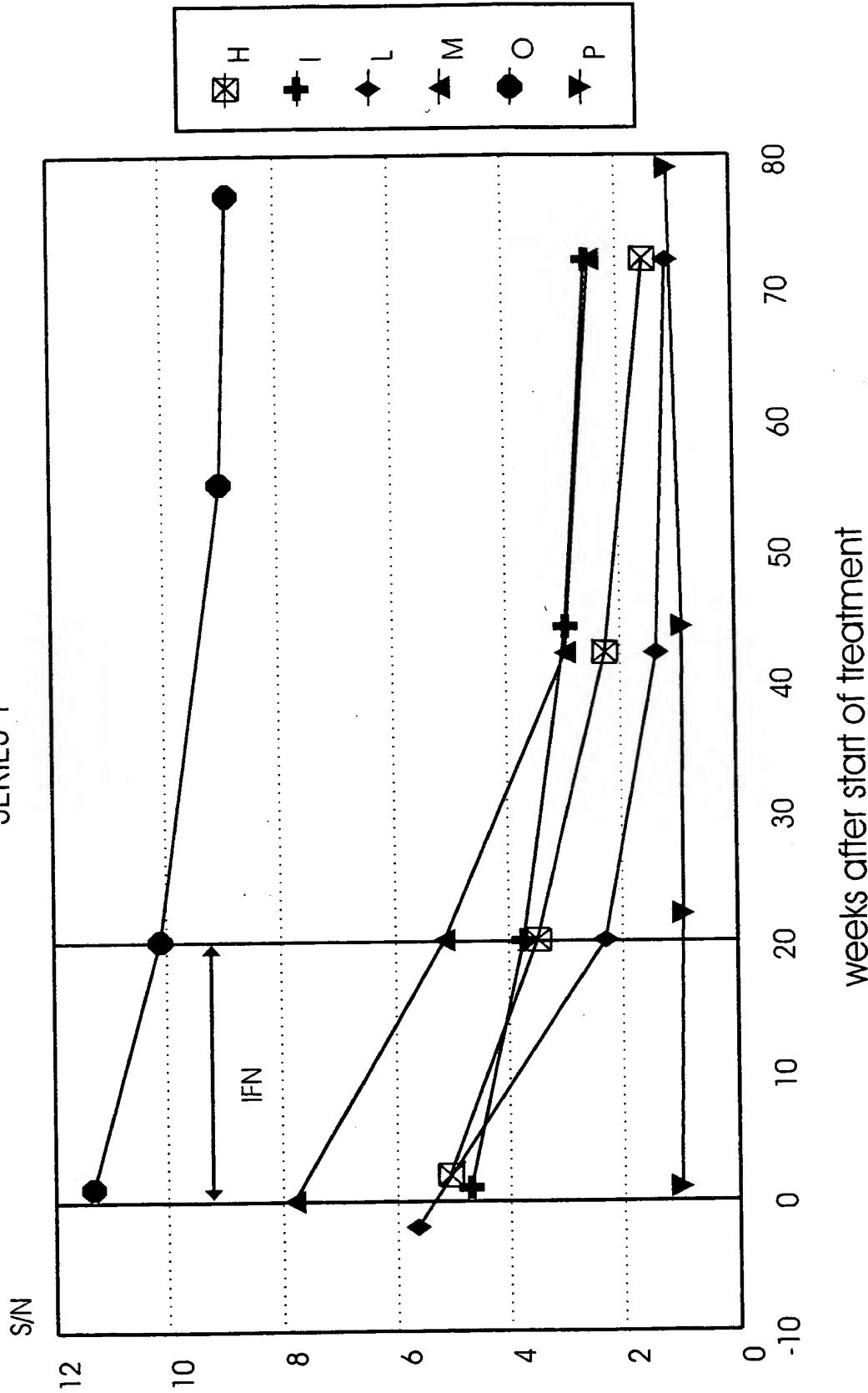
Fig. 5



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### Anti-E1 levels in RESPONDERS to IFN treatment

SERIES 1



weeks after start of treatment

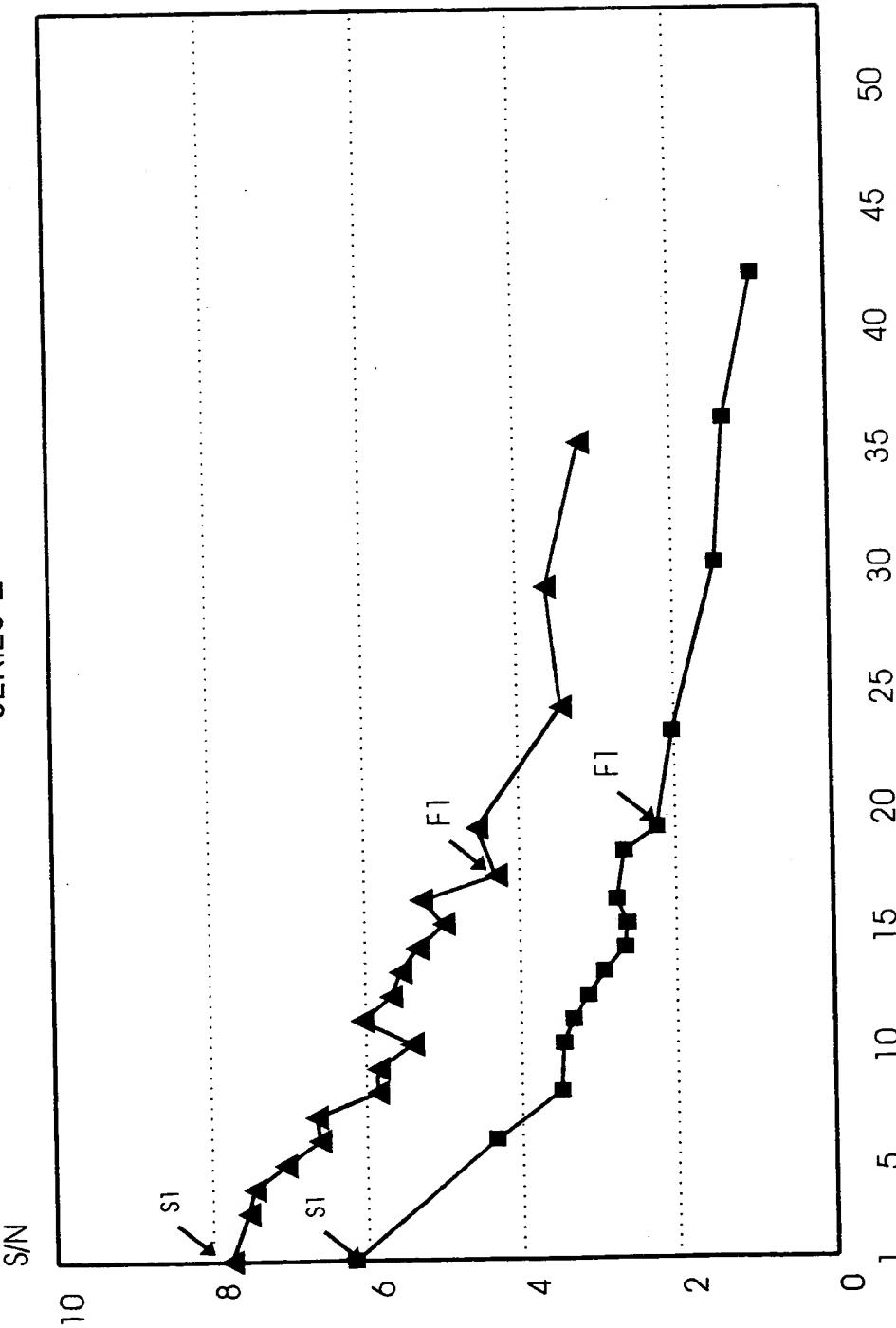
Fig. 6



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## Anti-E1 levels in patients with COMPLETE response to IFN

SERIES 2



months after start of treatment

Fig. 7



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## Anti-E1 levels in INCOMPLETE responders to IFN treatment

### SERIES 2

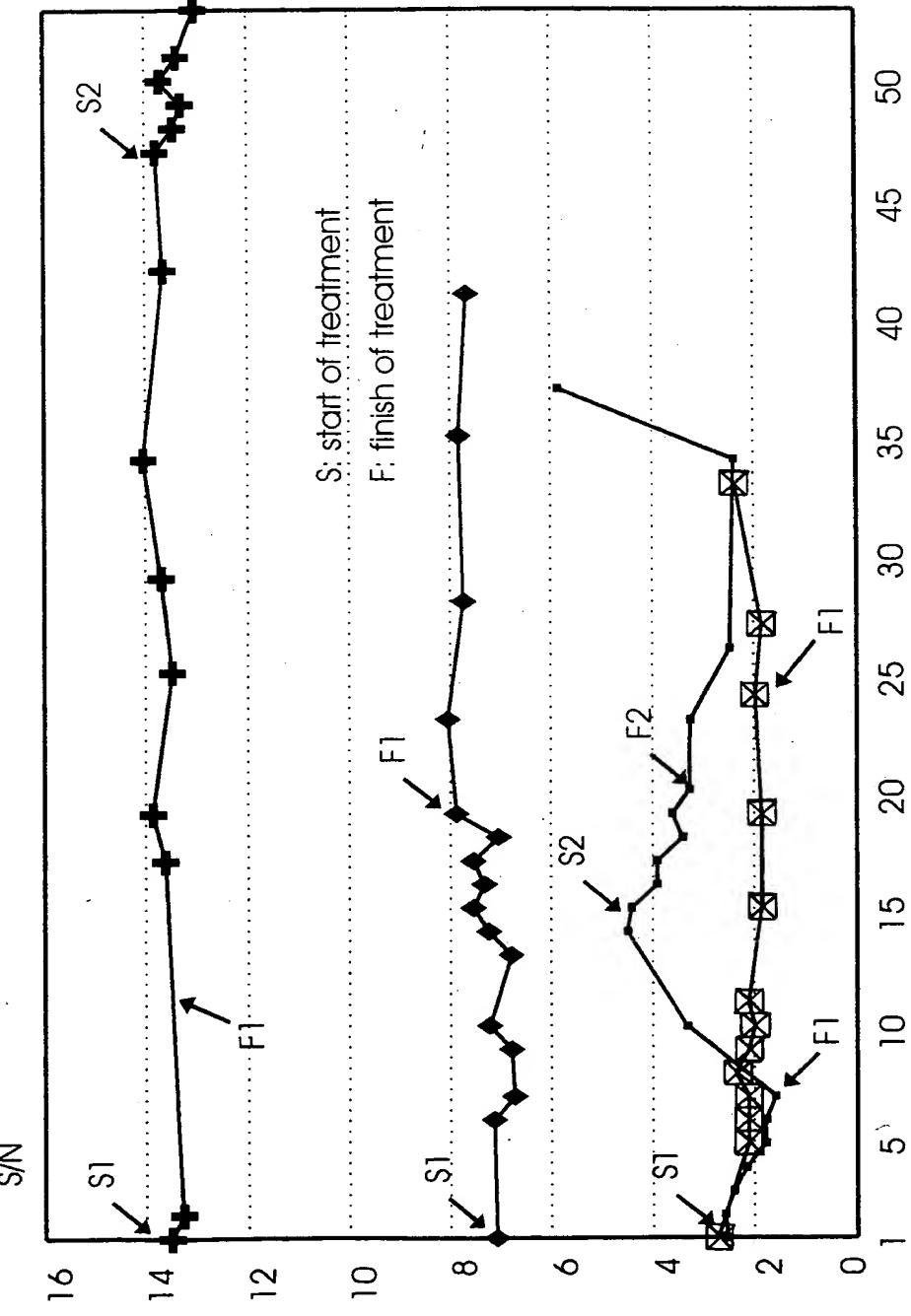


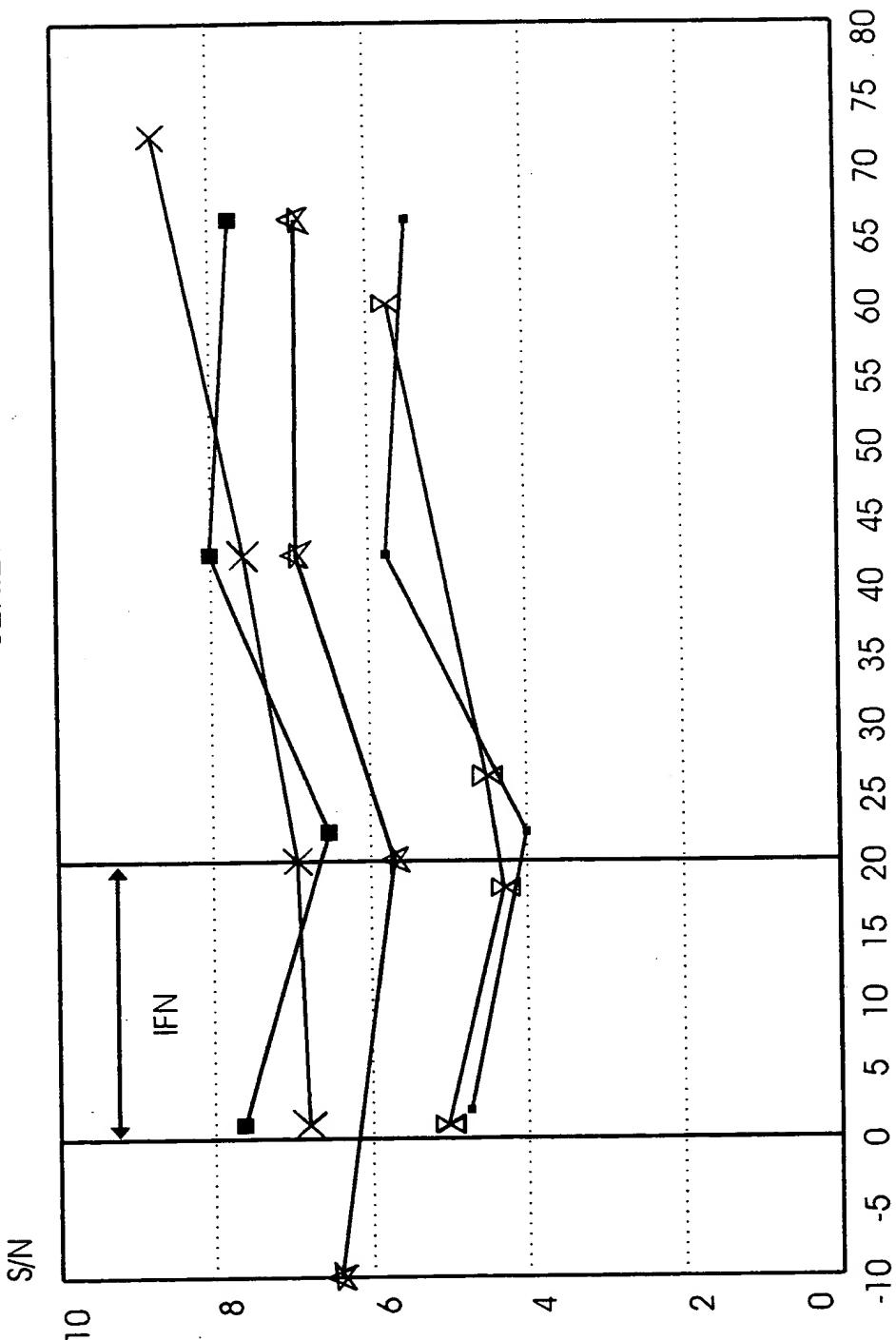
Fig. 8  
months after start of treatment



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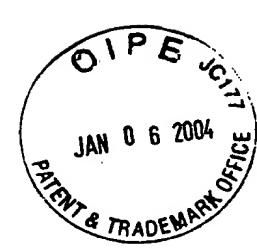
## Anti-E2 levels in NON-RESPONDERS to IFN treatment

SERIES 1



weeks after start of treatment

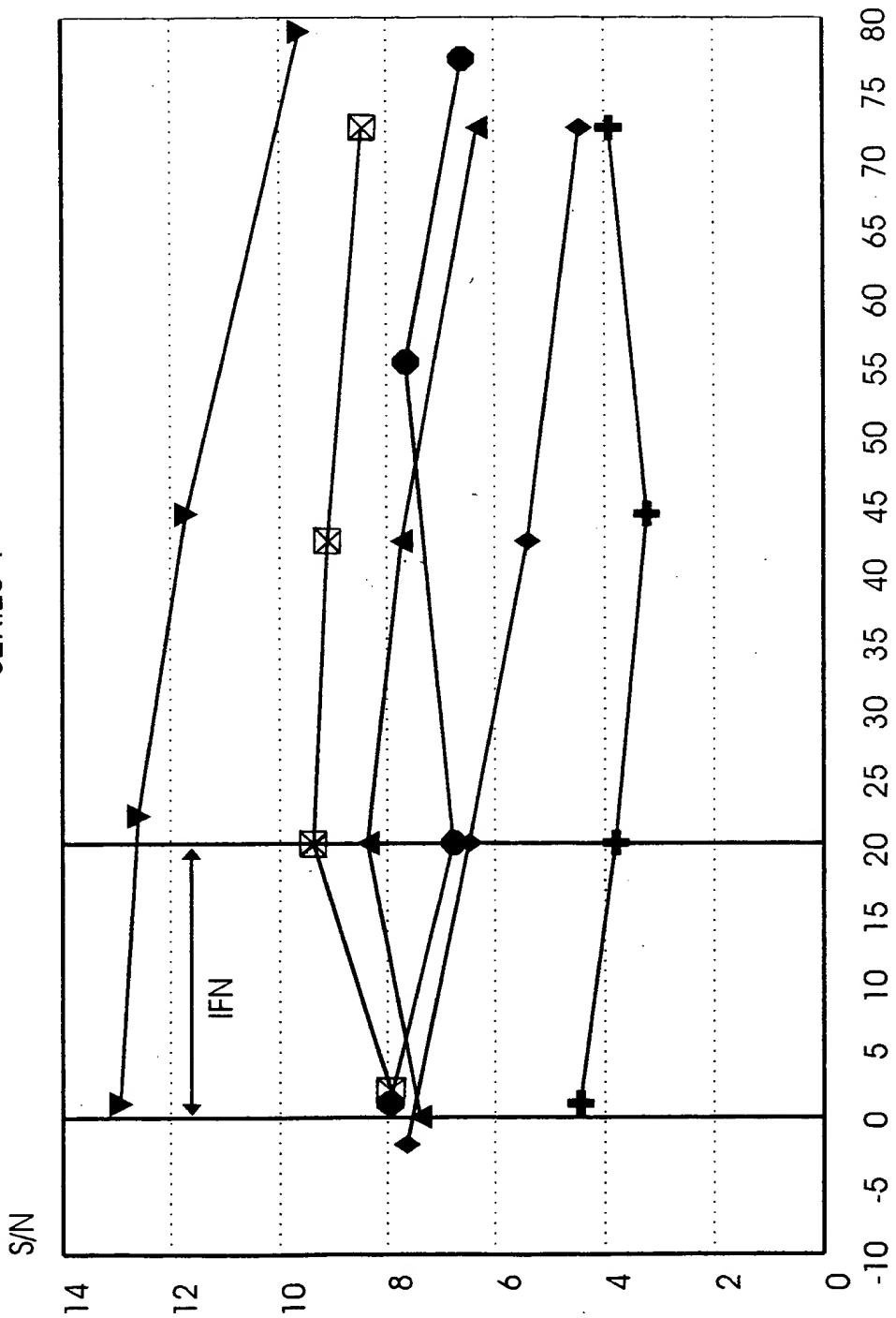
**Fig. 9**



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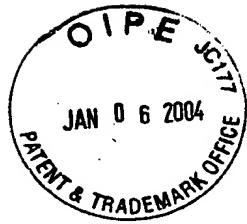
## Anti-E2 levels in RESPONDERS to IFN treatment

SERIES 1



weeks after start of treatment

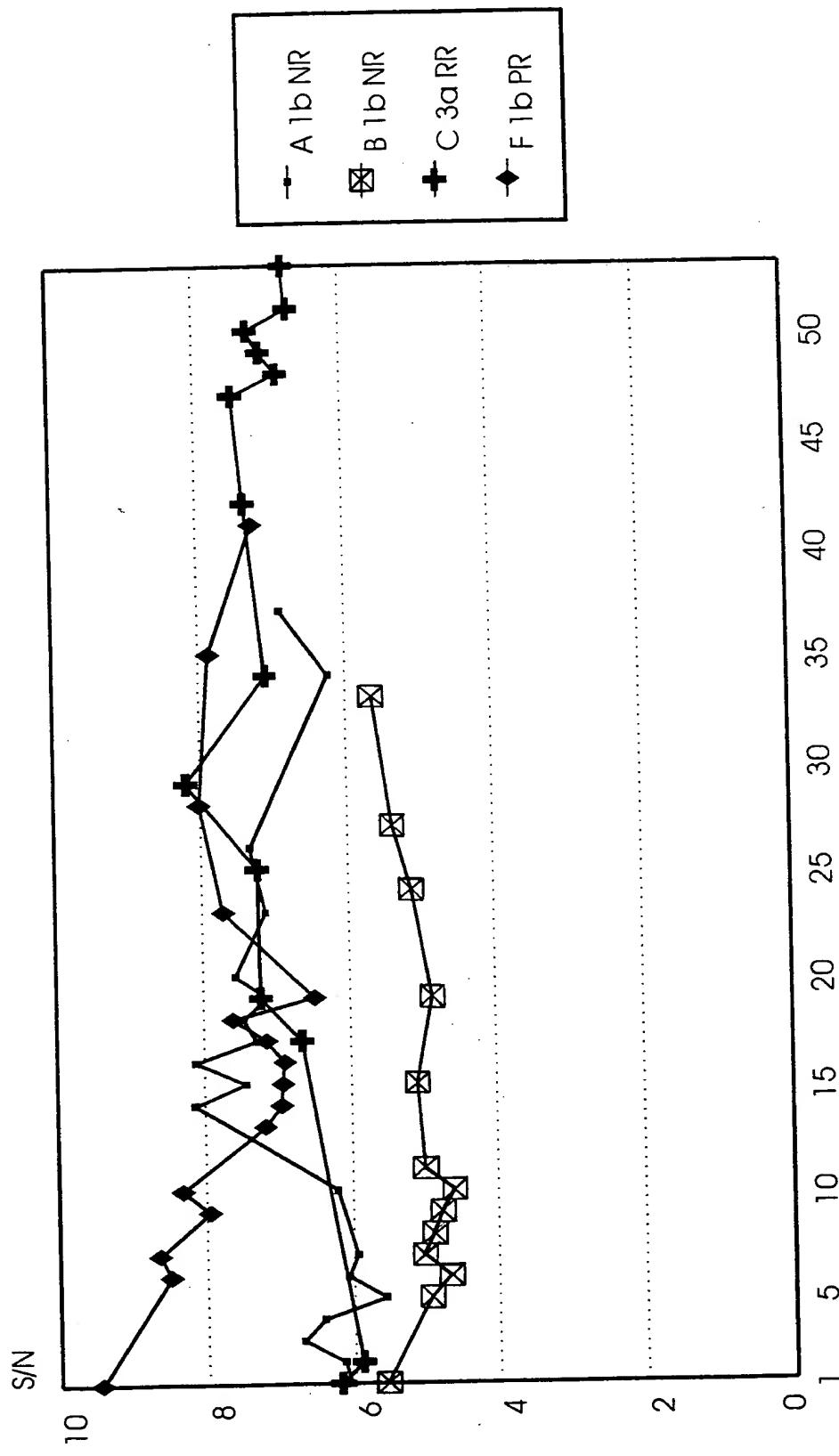
Fig.10



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## Anti-E2 levels in INCOMPLETE responders to IFN treatment

### SERIES 2



months after start of treatment

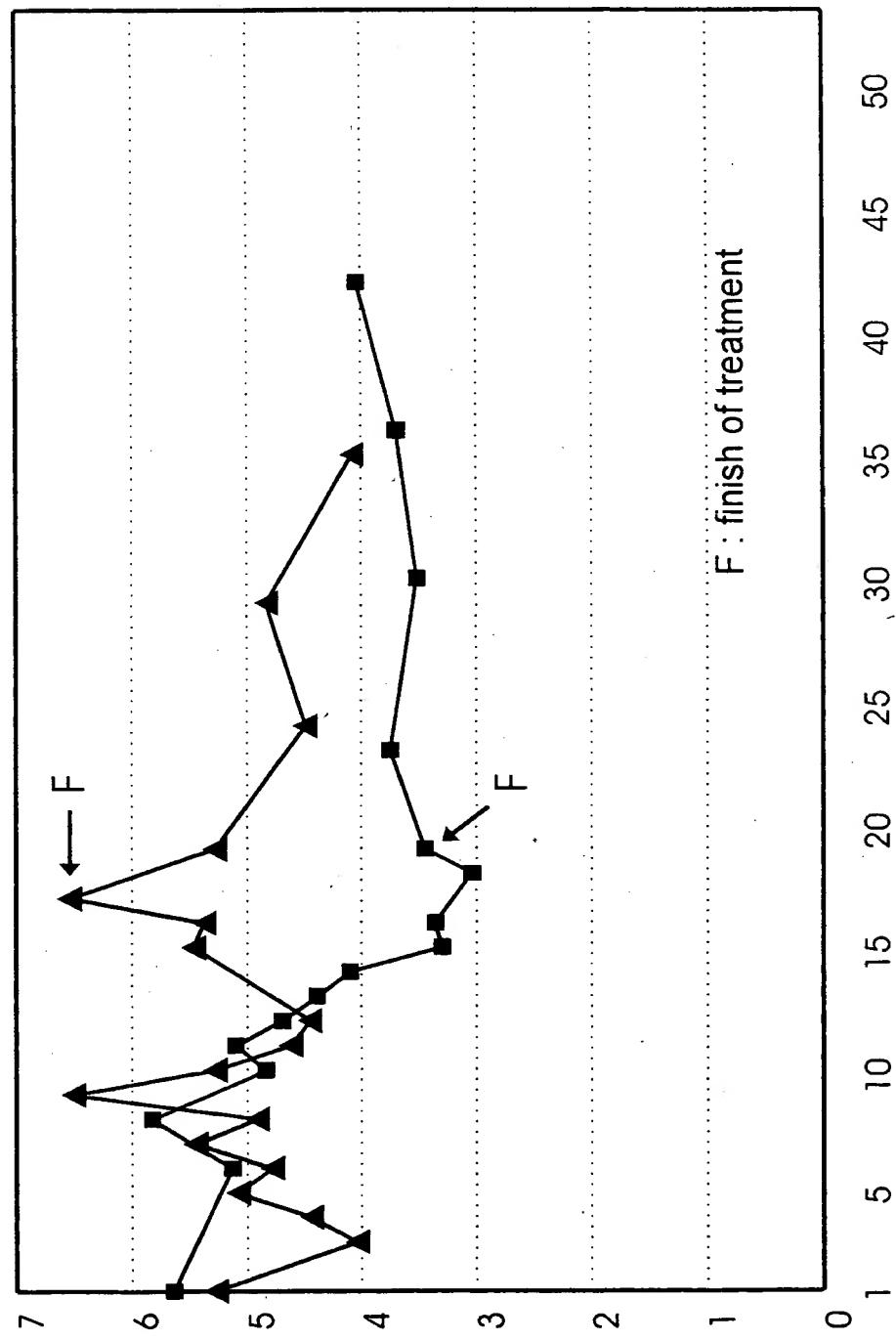
**Fig. 11**



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## Anti-E2 levels in COMPLETE responders to IFN treatment

SERIES 2



F : finish of treatment

months after start of treatment

Fig. 12



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## Human anti-E1 reactivity competed with peptides

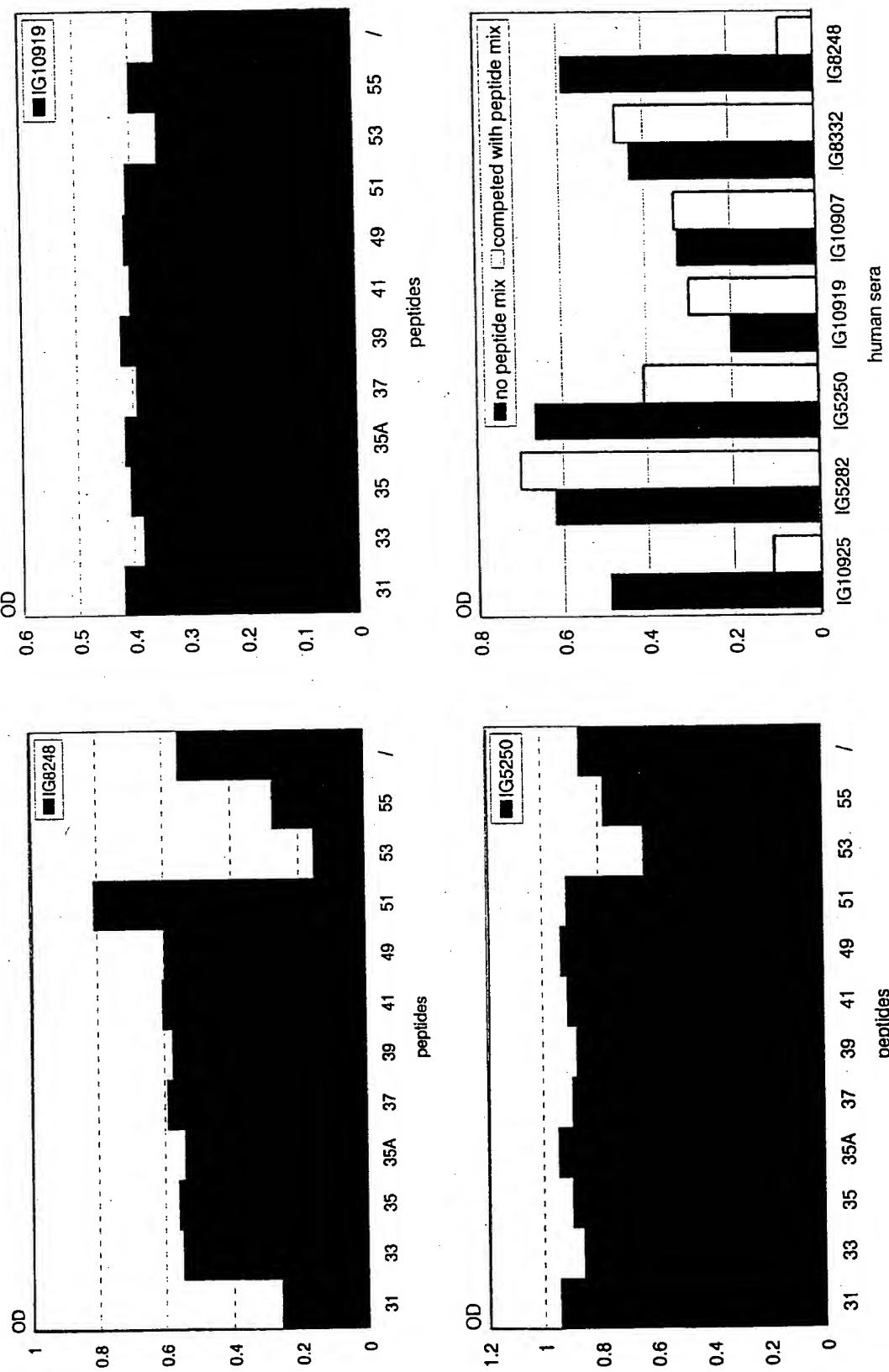


Fig. 13

# Competition of reactivity of anti-E1 Mabs with peptides



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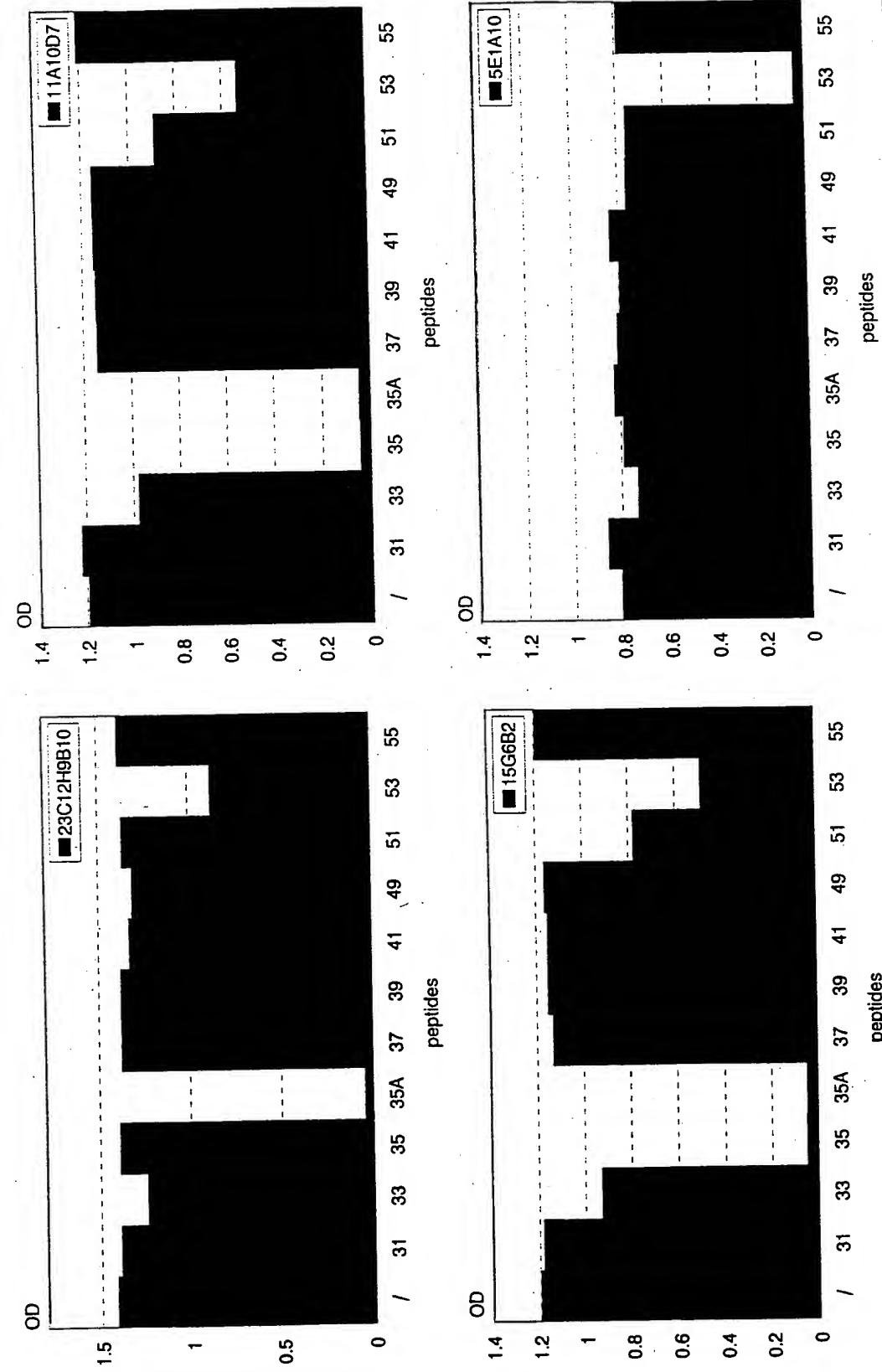


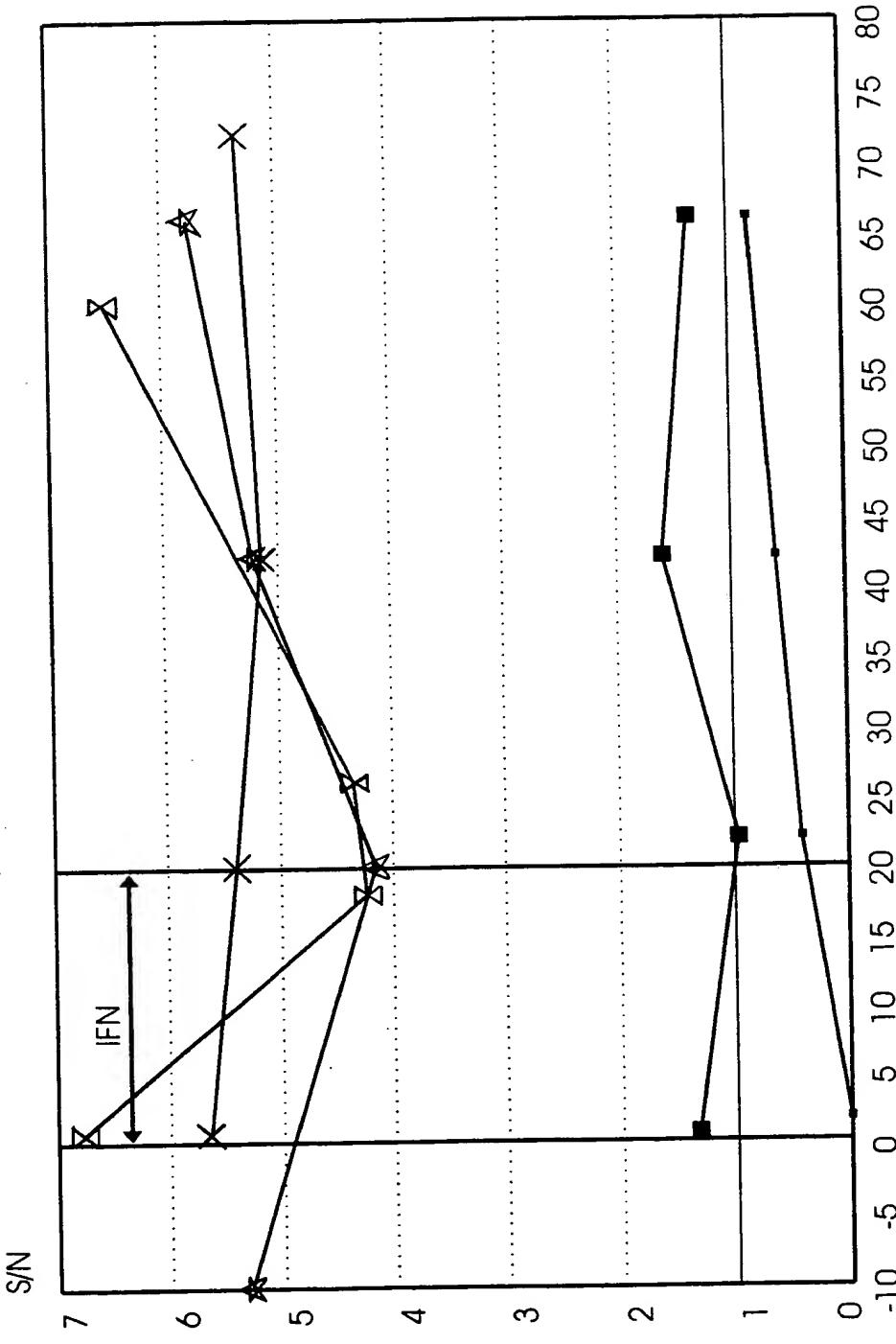
Fig.14



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# Anti-E1 (epitope 1) levels in NON-RESPONDERS to IFN treatment

## SERIES 1



weeks after start of treatment

Fig. 15



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## Anti-E1 (epitope 1) levels in RESPONDERS to IFN treatment

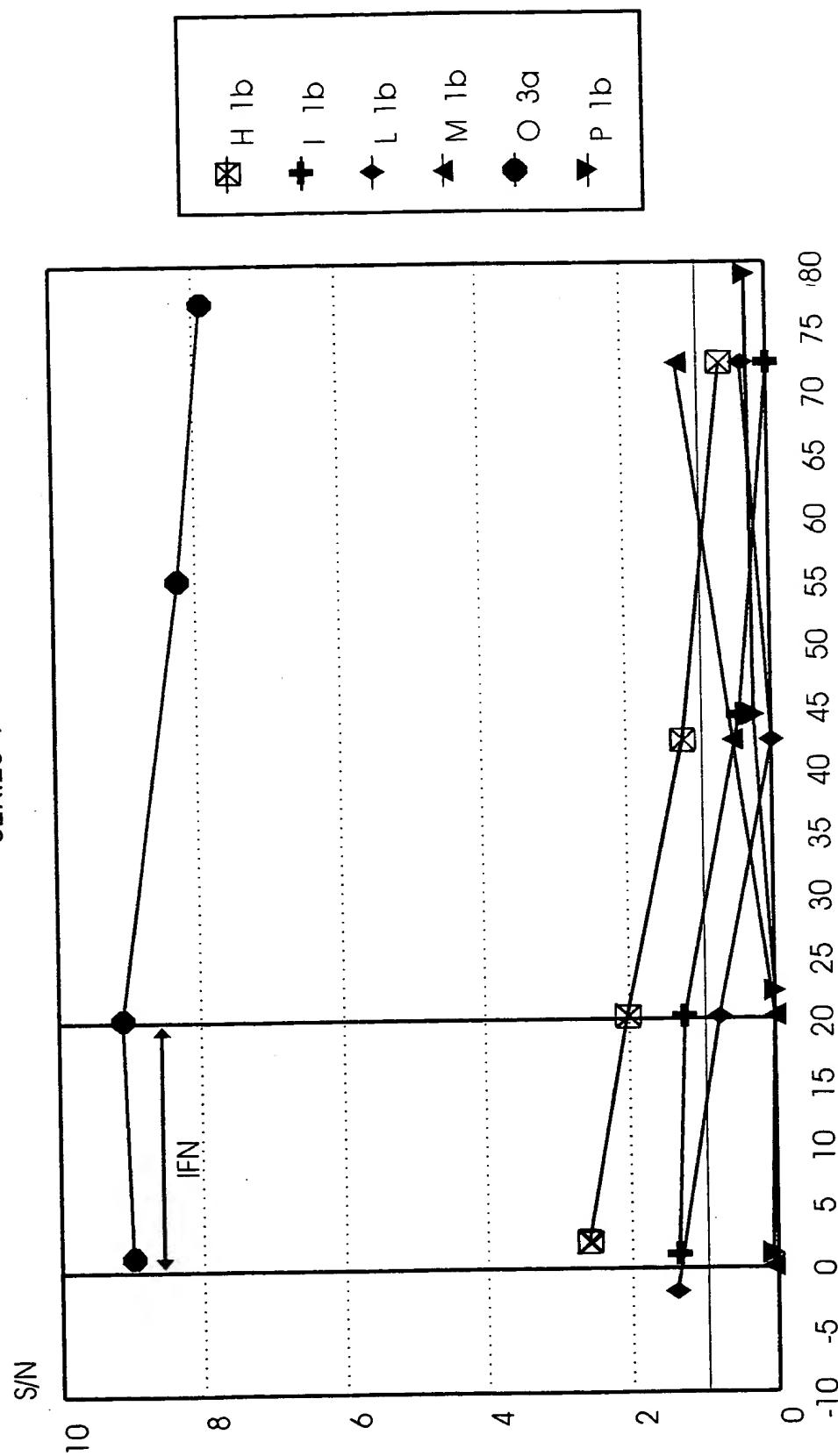


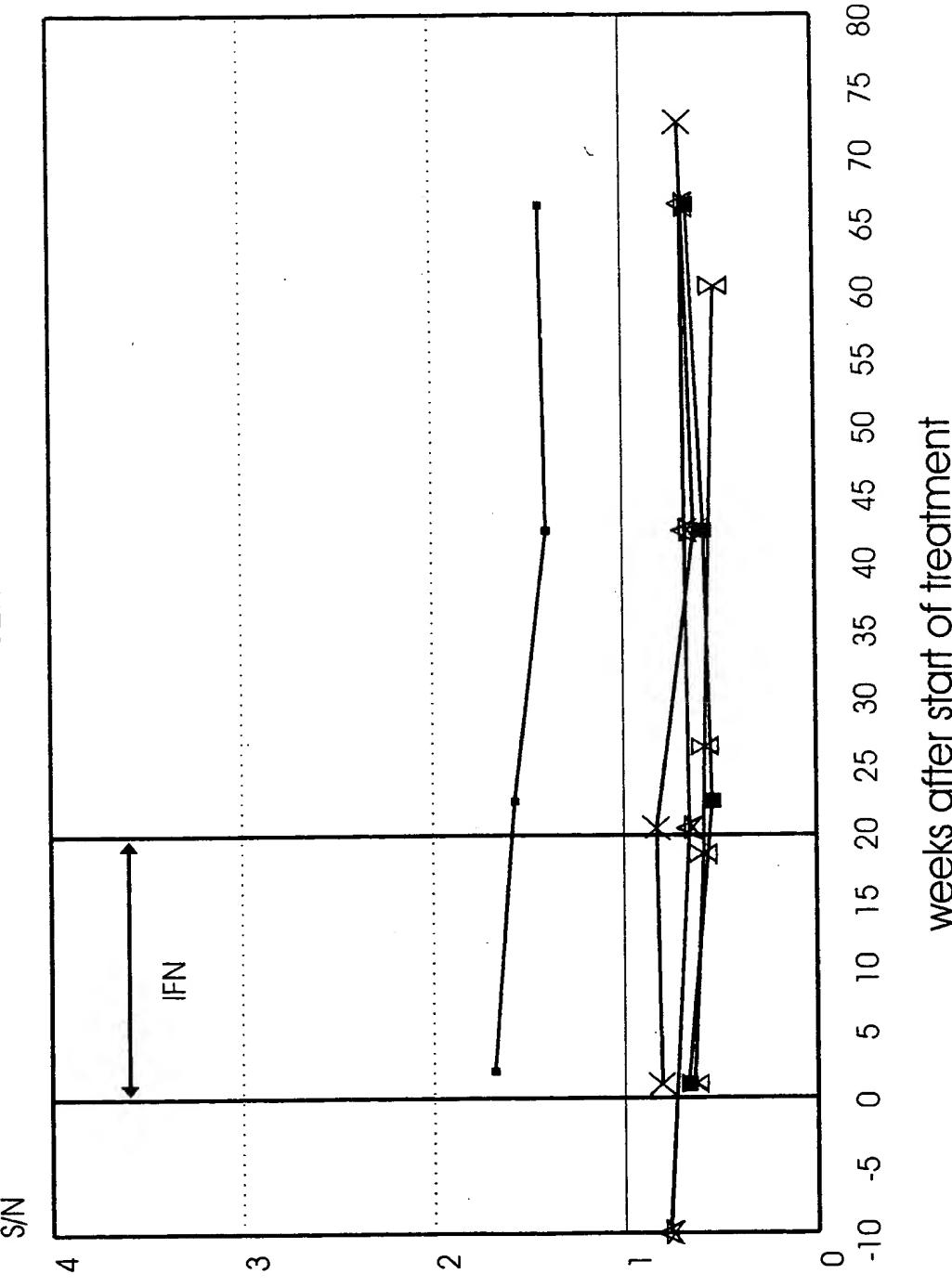
Fig. 16  
Anti-E1 (epitope 1) levels in RESPONDERS to IFN treatment



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# Anti-E1 (epitope 2) levels in NON-RESPONDERS to IFN treatment

## SERIES 1



weeks after start of treatment

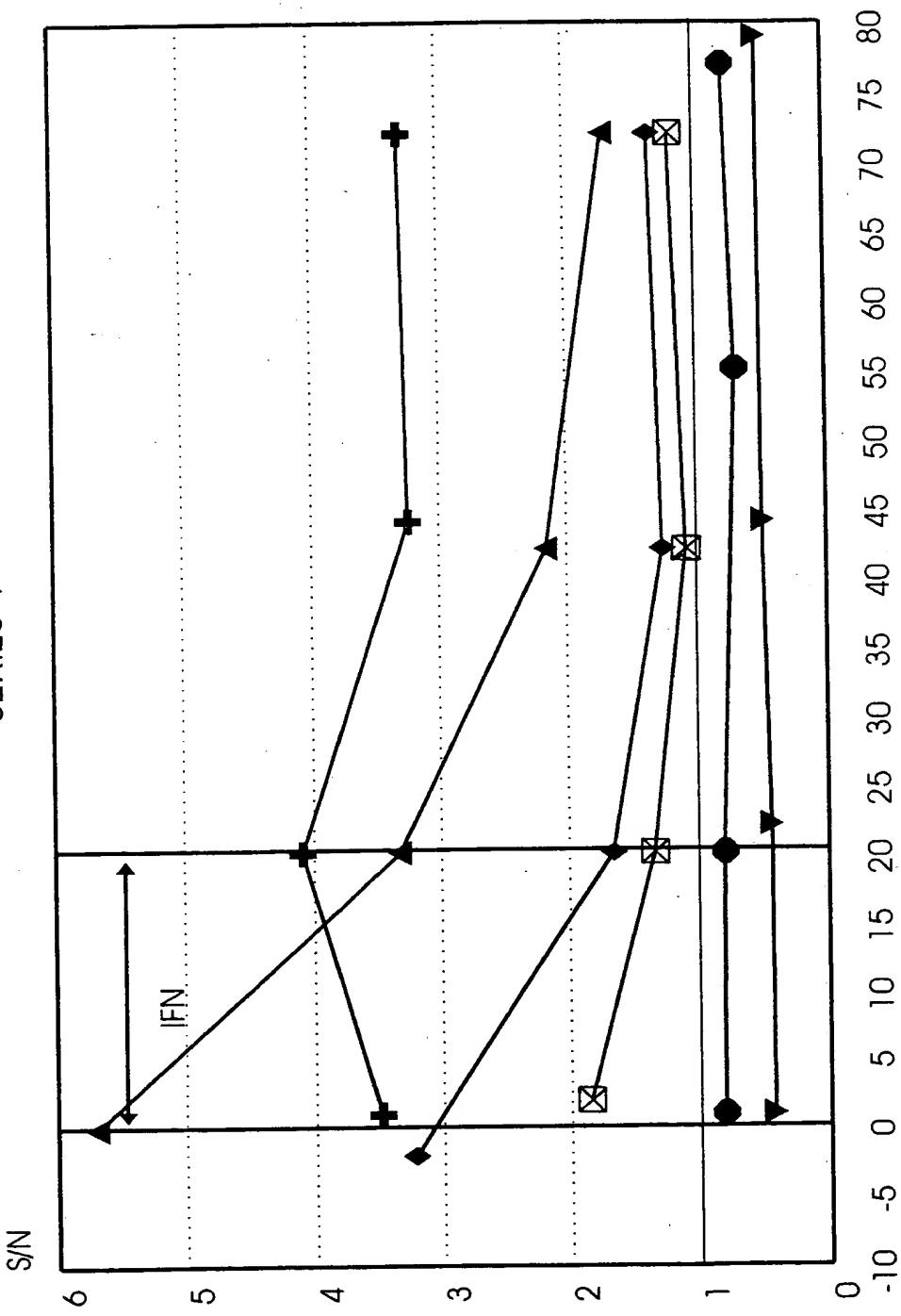
Fig. 17



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# Anti-E1 (epitope 2) levels in RESPONDERS to IFN treatment

SERIES 1



weeks after start of treatment

Fig. 18



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## Competition of reactivity of anti-E2 Mabs with peptides

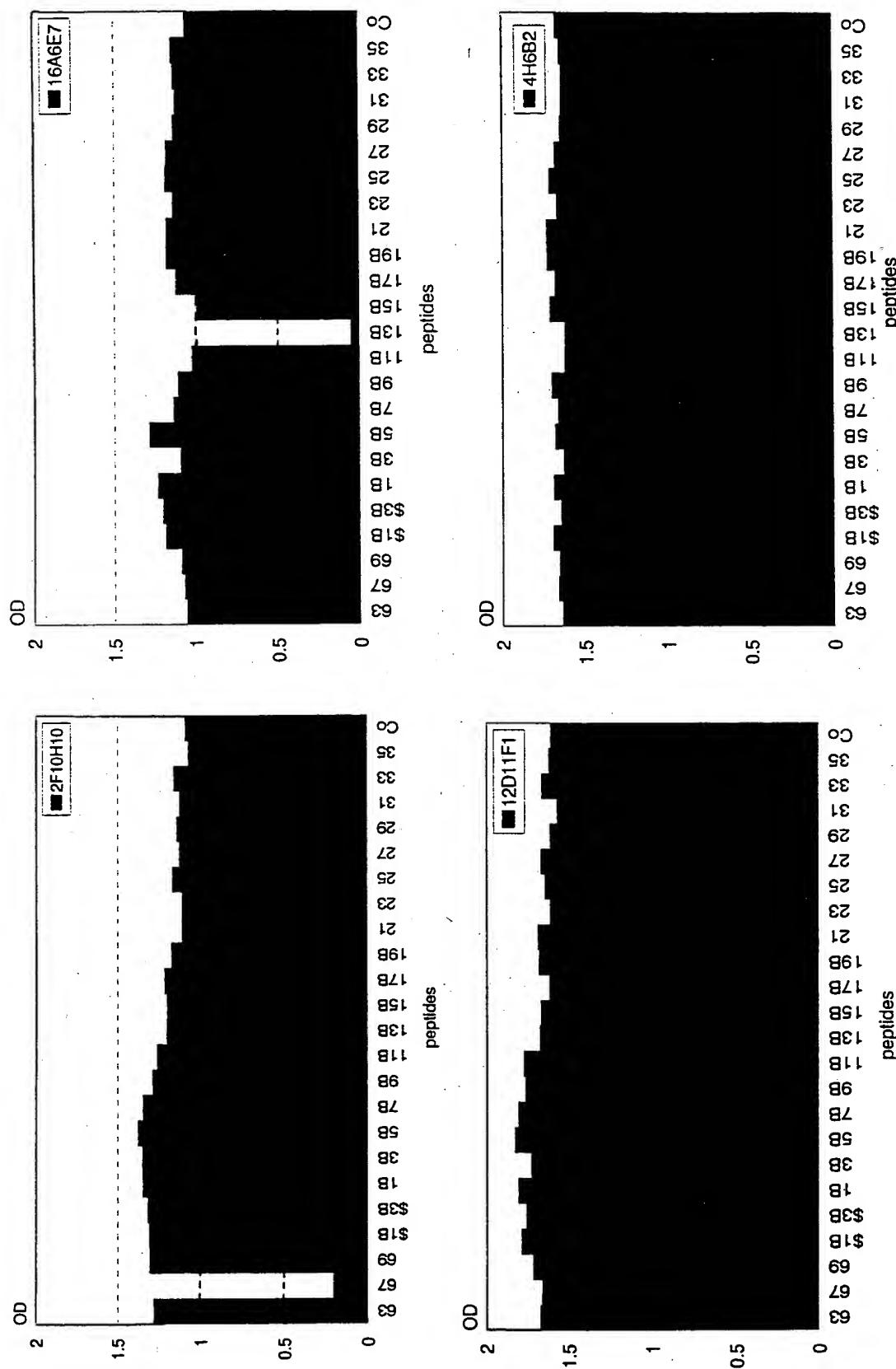


Fig. 19

# Human anti-E2 reactivity competed with peptides



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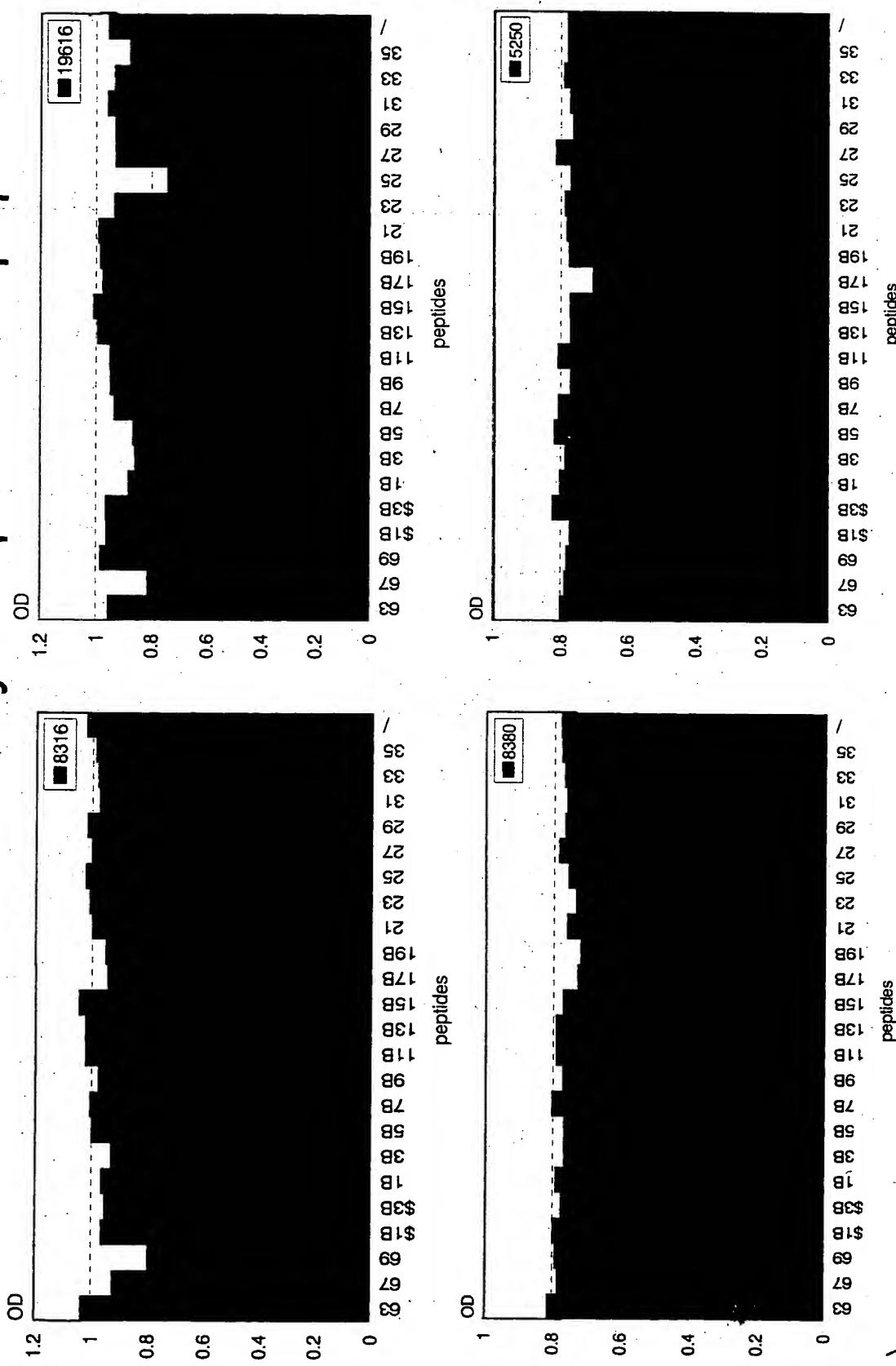
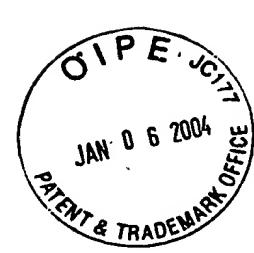


Fig. 20



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## Fig. 21A

5' GGCATGCAAGCTTAATTAATT3' (SEQ ID NO 1)

3'ACGTCCGTACGTTCGAATTAATTAATCGA5' (SEQ ID NO 94)

5'CCGGGGAGGCCTGCACGTGATCGAGGGCAGACACCATCACCAACCACATCACTAATAGT  
TAATTAACTGCA 3' (SEQ ID NO 2)

3'CCTCCGGACGTGCACTAGCTCCGTGTGGTAGTGGTGGTAGTGATTATCAATTAATTG  
5' (SEQ ID NO 95)

SEQ ID NO 3 (HCCI9A)

ATGCCCGGTTGCTCTTCTCTATCTCCTCTGGCTTACTGTCCGTGACCATTCCA  
GCTTCCGCTTATGAGGTGCGCAACGTGTCGGGATGTACCATGTCACGAACGACTGCT  
CCAACCTCAAGCATTGTATGAGGCAGCGGACATGATCATGCACACCCCCGGTGCCTG  
GCCCTGCCTCGGGAGAACAAACTCTCCCGCTGCTGGTAGCGCTACCCCCACGCTC  
GCAGCTAGGAACGCCAGCGTCCCCACCGACAATACGACGCCACGTCGATTGCTCG  
TTGGGGCGGCTGCTCTGTTCCGCTATGTACGTGGGGATCTCTGCGGATCTGTCTTC  
CTCGTCTCCAGCTGTTACCATCTGCCCTGCCGGCATGAGACGGTGCAGGACTGCA  
ATTGCTCAATCTATCCGGCACATAACAGGTACCGTATGGCTGGATATGATGAT  
GAACCTGGTCGCCTACACGGCCCTGGTGGTATCGCAGCTGCCGGATCCCACAAGCT  
GTCGTGGACATGGTGGCGGGGCCATTGGGGAGTCCTGGCGGGCCTGCCTACTATT  
CCATGGTGGGGAACTGGGCTAAGGTTTGATTGTGATGCTACTCTTGCTCTAATAG

SEQ ID NO 5 (HCCI10A)

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TTCCGCTCGTCGGCGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGGCGTCCG  
GGTTCTGGAGGAACGGCGTGAACATGCAACAGGAATTGCCCGTTGCTCTTCTCT  
ATCTTCCCTTGGCTTGCTGCTGTGACCGTTCCAGCTCCGTTATGAAGTGCG  
CAACGTGTCGGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTGTAT  
GAGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTGCCTGGAGAAC  
AACTCTTCCGCTGCTGGTAGCGCTACCCCCACGCTCGCAGCTAGGAACGCCAGCG  
TCCCCACGACAATACGACGCCACGTCGATTGCTCGTTGGGGCGGCTGCTTCTG



## Fig. 21B

TTCCGCTATGTACGTGGGGACCTCTGGGATCTGTCTCCCTCGTCTCCAGCTGTTCA  
CCATCTCGCCTCGCCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCCG  
CCACATAACGGGTACCGTATGGCTTGGATATGATGATGAACTGGTCGCCTACAACG  
GCCCTGGTGGTATCGCAGCTGCTCCGGATCCCACAAGCTGTCGGACATGGTGGCGG  
GGGCCATTGGGGAGTCCTGGCGGGTCTGCCTACTATTCCATGGTGGGGACTGGC  
TAAGGTTTGATTGTGATGCTACTCTTGCTCCCTAATAG

### SEQ ID NO 7 (HCCI11A)

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TTCCGCTCGTCGGCGCCCCCTAGGGGGTGTGCCAGAGCCCTGGCGCATGGCGTCCG  
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TCTTCCTCTGGCTTACTGTCTGTGACCATTCCAGCTCCGCTTATGAGGTGCGC  
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AGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTGCGTTGGGAGAAC  
ACTCTCCGCTGCTGGTAGCGCTACCCCCACGCTCGCAGCTAGGAACGCCAGCGT  
CCCCACTACGACAATACGACGCCACGTCGATTGCTCGTTGGGCGGCTGCTTCTGTT  
CCGCTATGTACGTGGGGATCTCTGCGATCTGTCTTCCCTCGTCTCCAGCTGTTCA  
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ACATAACAGGTACCGTATGGCTTGGATATGATGATGAACTGGTAATAG

### SEQ ID NO 9 (HCCI12A)

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GCTTCCGCTTATGAAGTGCACACGTGTCGGGGTGTACCATGTCACGAACGACTGCT  
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GCCCTGCGTTGGGAGGGCAACTCCTCCGTTGCTGGTGGCGCTCACTCCCACGCTC  
GCGGCCAGGAACGCCACGTCGCCCCAACGACAATACGACGCCACGTCGATTGCTC  
GTTGGGGCTGCTGTTCTGTTCCGCTATGTACGTGGGGATCTCTGCGGATCTGTTT  
CCTTGTTCCCAGCTGTTCACCTCTCACCTGCCGGCATCAAACAGTACAGGACTGCA  
ACTGCTCAATCTATCCGGCCATGTATCAGGTACCGCATGGCTTGGATATGATGAT  
GAACTGGTCCTAATAG

### SEQ ID NO 11 (HCCI13A)

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GCTTCCGCTTATGAAGTGCACACGTGTCGGGGTGTACCATGTCACGAACGACTGCT  
CCAACTCAAGCATAGTGTATGAGGCAGCGGACATGATCATGCACACCCCCGGTGC



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## Fig. 21C

GCCCTGCCTCGGGAGGGCAACTCCTCCCGTTGCTGGGTGGCGCTCACTCCCACGCTC  
GCGGCCAGGAACGCCAGCGTCCCCACAACGACAATACGACGCCACGTCGATTTGCTC  
GTTGGGGCTGCTGCTTCTGTTCCGCTATGTACGTGGGGGATCTCTGCGGATCTGTTTT  
CCTGTTCCAGCTGTCACCTTCTCACCTCGCCGGCATCAAACAGTACAGGACTGCA  
ACTGCTCAATCTATCCCGGCCATGTATCAGGTACCGCATGGCTGGGATATGATGAT  
GAACTGGTAATAG

SEQ ID NO 13 (HCCI17A)

ATGCTGGTAAGGCCATCGATAACCTTACGTGCGGCTCGCCACCTCGTGGGTACA  
TTCCGCTCGTCGGCGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGGCGTCCG  
GGTTCTGGAAGACGGCGTGAACTATGCAACAGGAATTGCTGGTTGCTTTCTCTA  
TCTTCCTCTTGGCTTACTGTCTGTCTAACCAATTCCAGCTTCCGCTTACGAGGTGCGC  
AACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAACCTAACGCATTGTGTATG  
AGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTGCGTCCGGAGAAC  
ACTCTTCCGCTGCTGGGTAGCGCTACCCCCACGCTCGCGCTAGGAACGCCAGCAT  
CCCCACTACAACAATACGACGCCACGTCGATTGCTCGTTGGGGCGGCTGTTCTGTT  
CCGCTATGTACGTGGGGATCTCTGCGGATCTGTCTTCCCTCGCTCCAGCTGTTCA  
ATCTCGCCTCGCCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCGGCC  
ACATAACGGGTACCGTATGGCTGGGATATGATGATGAACTGGTACTAATAG

SEQ ID NO 15 (HCPr51)

ATGCCCGGTTGCTTTCTATCTT

SEQ ID NO 16 (HCPr52)

ATGTTGGTAAGGTACATCGATAACCT

SEQ ID NO 17 (HCPr53)

CTATTAGGACCAGTTCATCATCATATCCCA

SEQ ID NO 18 (HCPr54)

CTATTACCAGTTCATCATCATATCCCA

SEQ ID NO 19 (HCPr107)

ATACGACGCCACGTCGATTCCAGCTGTTACCCATC



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## Fig. 21D

SEQ ID NO 20 (HCPr108)

GATGGTGAACAGCTGGGAATCGACGTGGCGTCGTAT

SEQ ID NO 21 (HCCI37)

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GGTTCTGGAGGAACGGCGTGAACATATGCAACAGGGAAATTGCCCGGTTGCTCTTCTCT  
ATCTTCCTCTTGGCTTGCTGTCCTGTCTGACCGTTCCAGCTTCGCTTATGAAGTGCG  
CAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTGTGTAT  
GAGGCAGCGGACATGATCATGCAACACCCCCGGTGCCTGCCCTGCCTCGGGAGAAC  
AACTCTCCGCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG  
TCCCCACGACAATACGACGCCACGTCGATTCCCAGCTGTTACCATCTCGCCTCG  
CCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCGGCCACATAACGGGT  
CACCGTATGGCTTGGATATGATGATGAACTGGTCGCCTACAACGGCCCTGGTGGTAT  
CGCAGCTGCTCCGGATCCCACAAGCTGTCGGACATGGTGGGGGGCCATTGGGG  
AGTCCTGGCGGGTCTGCCTACTATTCCATGGTGGGAACGGGCTAAGGTTTGATTG  
TGATGCTACTCTTGCTCCCTAATAG

SEQ ID NO 23 (HCCI38)

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GGTTCTGGAGGAACGGCGTGAACATATGCAACAGGGAAATTGCCCGGTTGCTCTTCTCT  
ATCTTCCTCTTGGCTTGCTGTCCTGTCTGACCGTTCCAGCTTCGCTTATGAAGTGCG  
CAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTGTGTAT  
GAGGCAGCGGACATGATCATGCAACACCCCCGGTGCCTGCCCTGCCTCGGGAGAAC  
AACTCTCCGCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG  
TCCCCACGACAATACGACGCCACGTCGATTCCCAGCTGTTACCATCTCGCCTCG  
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CACCGTATGGCTTGGATATGATGATGAACTGGTAA  
TAG

SEQ ID NO 25 (HCCI39)

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GGTTCTGGAGGAACGGCGTGAACATATGCAACAGGGAAATTGCCCGGTTGCTCTTCTCT



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## Fig. 21E

ATCTTCCTTGGCTTGCTGTCCTGTCAGCGTCCAGCTTCGCTTATGAAGTGC  
CAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAAGCATTGTGTAT  
GAGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTGCAGCTGGAGAAC  
AACTCTTCCCCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG  
TCCCCACCACGACAATACGACGCCACGTCGATTCCCAGCTGTTACCATCTCGCCTCG  
CCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCGGCCACATAACGGGT  
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CGCAGCTGCTCCGGATCCTCTAATAG.

SEQ ID NO 27 (HCCI40)

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ATCTTCCTTGGCTTGCTGTCCTGTCAGCTCCAGCTTCGCTTATGAAGTGC  
CAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAAGCATTGTGTAT  
GAGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTGCAGCTGGAGAAC  
AACTCTTCCCCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG  
TCCCCACCACGACAATACGACGCCACGTCGATTCCCAGCTGTTACCATCTCGCCTCG  
CCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCGGCCACATAACGGGT  
CACCGTATGGCTTGGATATGATGATGAACTGGTCGCCTACAACGGCCCTGGTGGTAT  
CGCAGCTGCTCCGGATCGTATCGAGGGCAGACACCACCACTCACTAATAG

SEQ ID NO 29 (HCCI62)

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TCCTTCTCGCTCTGTTCTTGCTTAATTGCAACAGCTAGTCTAGAGTGGCGGAAT  
ACGTCGGCCTCTATGTCCTTACCAACGACTGTTCAATAGCAGTATTGTGTACGAGGC  
CGATGACGTTATTCTGCACACACCCGGCTGCATACCTTGTGTCAGGACGGCAATACA  
TCCACGTGCTGGACCCCAGTGACACCTACAGTGGCAGTCAAGTACGTCGGAGCAACCA  
CCGCTTCGATACGCAGTCATGTGGACCTATTAGTGGCGGCCACGATGTGCTCTGC  
GCTCTACGTGGGTGACATGTGTGGGGCTGCTTCCCTCGTGGACAAGCCTCACGTTCA  
GACCTCGTCGCCATCAAACGGTCCAGACCTGTAAGTGCCTGTAACCGAGGCCATCT  
TTCAGGACATCGAATGGCTTGGATATGATGATGAACTGGTAATAG



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## Fig. 21F

SEQ ID NO 31 (HCCI63)

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CCTTGAGGACGGGTAACATGCAACAGGGATTACCCGGTTGCTCTTCTATCT
TTATTCTGCTCTCTCGTGTGACCGTTCCGGCCTGCAGTCCCTACCGAAATG
CCTCTGGATTATCATGTTACCAATGATTGCCAAACTCTCCATAGTCTATGAGGCA
GATAACCTGATCCTACACGCACCTGGTTGCGTGCCTGTGTCATGACAGGTAATGTGA
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GGCTCCTCTCGGAGAGCCGTTGACTACCTAGCGGGAGGGGCTGCCCTGCTCCGCG
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TACCGGCCACCGGATGGCATGGATATGATGATGAACGGTAATAG
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SEQ ID NO 33 (HCPr109)

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TGGGATATGATGATGAACGGTC
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SEQ ID NO 34 (HCPr72)

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CTATTATGGTGGTAAKGCCARCARCAGAGCAGGAG
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SEQ ID NO 35 (HCCL22A)

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TTGCGCGCGTACGGGATACCCCGTGTCAAGGAGGGCAGCAGCCTCCGATACCA
GGGGCTTGTGTCCTCTTAGCCCCGGTCGGCTCAGAAAATCCAGCTCGTAAACAC
CAACGGCAGTTGGCACATCAACAGGACTGCCCTGAACGCAACGACTCCCTCAAAC
AGGTTCTTGGCGACTATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAG
CGCTTGGCCAGCTGCGCTCCATCGACAAGTTGCTCAGGGGTGGGGTCCCCTCACTT
ACACTGAGCCTAACAGCTCGGACCAGAGGCCCTACTGCTGGCACTACGCGCCTCGACC
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CTGTTGTGGTGGGACGACCGATGGTTGGTCCCCACGTATAACTGGGGGGCGAA
CGACTCGGATGTGCTGATTCTCAACAAACACGCGGCCGCCGAGGCAACTGGTTGGC
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Atty. Dkt.: 2551-101

## Fig. 21G

CATTACCCATATAGGCTCTGGCACTACCCCTGCACTGTCAACTTACCCATCTTCAAGGT  
TAGGATGTACGTGGGGGGCGTGGAGCACAGGTTGAAGCCGCATGCAATTGGACTCG  
AGGAGAGCGTTGTGACTTGGAGGGACAGGGATAGATCAGAGCTTAGCCCGCTGCTGCTG  
TCTACAACAGAGTGGCAGATACTGCCCTGTTCTTACCCACCCCTGCCGGCCCTATCCA  
CCGGCCTGATCCACCTCCATCAGAACATCGTGGACGTGCAATACCTGTACGGTAGG  
GTCGGCGGTTGTCTCCCTTGTATCAAATGGGAGTATGTCCTGTTGCTCTTCCTTCCT  
GGCAGACGCGCGCATCTGCGCCTGCTTATGGATGATGCTGCTGATAGCTAAGCTGAG  
GCCGCCTTAGAGAACCTGGTGGTCCTCAATGCGGCGGCCGTGGCCGGGGCGATGGC  
ACTCTTCCTCCTTGTGTTCTCTGTGCTGCCTGGTACATCAAGGGCAGGCTGGTCCC  
TGGTGC GG CATACGCCTTCTATGGCGTGTGGCCGCTGCTCCTGCTCTGCTGGCCTTAC  
CACACAGAGCTTATGCCTAGTAA

SEQ ID NO 37 (HCCI41)

GATCCCACAAGCTGTCGTGGACATGGTGGCGGGGGCCATTGGGAGTCCTGGCGGG  
CCTCGCCTACTATTCCATGGTGGGAACTGGGCTAAGGTTTGGTTGTATGCTACTCT  
TTGCCGGCGTCGACGGGCATACCCCGTGTCAAGGAGGGCAGCAGCCTCCGATACCA  
GGGGCCTTGTGTCCTCTTAGCCCCGGTCGGCTCAGAAAATCCAGCTCGTAAACAC  
CAACGGCAGTTGGCACATCAACAGGACTGCCCTGAAGTCAACGACTCCCTCAAAC  
AGGGTTCTTGCCGCACTATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAG  
CGCTTGGCCAGCTGTCGCTCCATCGACAAGTTGCTCAGGGTGGGTCCCCTCACTT  
ACACTGAGCCTAACAGCTCGGACCAGAGGCCCTACTGCTGGCACTACGCCCTCGACC  
GTGTGGTATTGTACCCCGTCTCAGGTGTGCGGTCCAGTGTATTGCTTACCCCGAGCC  
CTGTTGGTGGGGACGACCGATGGTTGGTGTCCCCACGTATAACTGGGGGGCGAA  
CGACTCGGATGTGCTGATTCTCAACAAACACGCCGCCGCGAGGCAACTGGTTGGC  
TGTACATGGATGAATGGCACTGGTTACCAAGACGTGTGGGGCCCCCGTGCAACA  
TCGGGGGGCCGGCAACAAACACCTTGACCTGCCCACTGACTGTTTCGGAAGCACCC  
CGAGGCCACCTACGCCAGATGCCAGTGGTTCTGGCCCTGGCTGACACCTAGGTGTATGGTT  
CATTACCCATATAGGCTCTGGCACTACCCCTGCACTGTCAACTTACCCATCTTCAAGGT  
TAGGATGTACGTGGGGGGCGTGGAGCACAGGTTGAAGCCGCATGCAATTGGACTCG  
AGGAGAGCGTTGTGACTTGGAGGGACAGGGATAGATCAGAGCTTAGCCCGCTGCTGCTG  
TCTACAACAGAGTGGCAGAGTGGCAGAGCTTAATTAAATTAG

SEQ ID NO 39 (HCCI42)

GATCCCACAAGCTGTCGTGGACATGGTGGCGGGGGCCATTGGGAGTCCTGGCGGG  
CCTCGCCTACTATTCCATGGTGGGAACTGGGCTAAGGTTTGGTTGTATGCTACTCT



## Fig. 21H

TTGCCGGCGTCGACGGCATAACCGCGTGTCAAGGAGGGCAGCAGCCTCCGATACCA  
GGGGCCTTGTGTCCTCTTACAGCCCCGGGCGCTCAGAAAATCCAGCTCGTAAACAC  
CAACGGCAGTTGGCACATCAACAGGACTGCCCTGAAC TGCAACGACTCCCTCCAAAC  
AGGGTTCTTGCCGCACTATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAG  
CGCTTGGCCAGCTGTCGCTCCATCGACAAGTTGCTCAGGGTGGGTCCCCTCACTT  
ACACTGAGCCTAACAGCTCGGACCAGAGGCCACTGCTGGCACTACGCGCTCGACC  
GTGTGGTATTGTACCCCGTCTCAGGTGTGCGGTCCAGTGTATTGCTTCACCCCGAGCC  
CTGTTGTGGTGGGACGACCGATCGGTTGGTGTCCCCACGTATAACTGGGGGGCGAA  
CGACTCGGATGTGCTGATTCTAACAAACACGCGGCCGCGAGGCAACTGGTTCGGC  
TGTACATGGATGAATGGCACTGGTTACCAAGACGTGTGGGGCCCCCGTGAACA  
TCGGGGGGGCCGGAACAAACACCTTGACCTGCCCCACTGACTGTTTGGAAAGCACCC  
CGAGGCCACCTACGCCAGATCGGTTCTGGGCTGGCTGACACCTAGGTGTGGTT  
CATTACCCATATAGGCTCTGGCACTACCCCTGCACTGTCAACTTACCATCTCAAGGT  
TAGGATGTACGTGGGGGGCGTGGAGCACAGGTTCGAAGCCGATGCAATTGGACTCG  
AGGAGAGCGTTGTGACTTGGAGGACAGGGATAGATCAGAGCTTAGCCGCTGCTGCTG  
TCTACAACAGGTATCGAGGGCAGACACCACCATCACCACCATCACTAATAG

SEQ ID NO 41 (HCCI43)

ATGGTGGGAAC TGGCTAAGGTTTGGTTGATGCTACTCTTGCCGGCGTCGACG  
GGCATACCCCGCGTGTCAAGGAGGGCAGCAGCCTCCGATACCAGGGCCTTGTGTCCT  
CTTAGCCCCGGGCGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAGTTGGCAC  
ATCAACAGGACTGCCCTGAAC TGCAACGACTCCCTCCAAACAGGGTTTTGCCGCAC  
TATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAGCGCTTGGCCAGCTGTCG  
CTCCATCGACAAGTTGCTCAGGGTGGGTCCCCTACTTACACTGAGCCTAACAGC  
TCGGACCAGAGGCCCTACTGCTGGCACTACGCGCTCGACC GTGTGGTATTGTACCCG  
CGTCTCAGGTGTGCGGTCCAGTGTATTGCTTACCCCGAGCCCTGTTGTGGTGGGAC  
GACCGATCGGTTGGTGTCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTG  
ATTCTCAACAAACACGCGGCCGCCGAGGCAACTGGTTGGCTGTACATGGATGAATG  
GCACTGGTTACCAAGACGTGTGGGGCCCCCGTGAACATCGGGGGGCCGGCA  
ACAACACCTTGACCTGCCCCACTGACTGTTTGGGAAGCACCCGAGGCCACCTACGC  
CAGATCGGTTCTGGGCCCTGGCTGACACCTAGGTGTGGTCAATTACCATATAGG  
CTCTGGCACTACCCCTGCACTGTCAACTCACCACCATCTCAAGGTTAGGATGTACGTGG  
GGCGTGGAGCACAGGTTCGAAGCCGATGCAATTGGACTCGAGGAGAGCGTTGTGA  
CTTGGAGGACAGGGATAGATCAGAGCTTAGCCGCTGCTGTCTACAACAGAGTGG  
CAGAGCTTAATTAATTAG



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## Fig. 21I

SEQ ID NO 43 (HCCI44)

ATGGTGGGAACTGGCTAAGGTTGGTGTGATGCTACTCTTGCCGGCGTCGACG  
GGCATAACCGCGTGTCAAGGAGGGCAGCAGCCTCCGATACCAGGGCCTGTGTC  
CTTAGCCCCGGGTCGGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAGTGGC  
ACATCAACAGGACTGCCCTGAAC TGCAACGACTCCCTCAAACAGGGTTCTTGCC  
TATTCTACAAACACAAATTCAACTCGTCTGGATGCCAGAGCGCTTGGCAGCTG  
CTCCATCGACAAGTCGCTCAGGGTGGGCTCCACTTACACTGAGCCTAACAGC  
TCGGACCAGAGGCCACTGCTGGCACTACGCGCCTGACC GTGTGGTATTGTAC  
CGTCTCAGGTGTGGTCCAGTGTATTGCTTACCCCCAGCCCTGTTGGTGGGAC  
GACCGATCGGTTGGTCCACGTATAACTGGGGCGAACGACTCGGATGTGCTG  
ATTCTCAACAAACACGCGGCCGCCGAGGCAACTGGTTCGGCTGTACATGGATGA  
GCACTGGTTCACCAAGACGTGTGGGGCCCCCGTGCAACATGGGGGGCCGGCA  
ACAACACCTTGACCTGCCCCACTGACTGTTT CGGAAGCACCCGAGGCCACCTAC  
CAGATCGGTTCTGGCCCTGGCTGACACCTAGGTGTATGGTTCATTACCCATATAG  
CTCTGGCACTACCCCTGCACTGTCAACTTACCATCTTCAAGGTTAGGATGTAC  
GGCGTGGAGCACAGGTTGAAGCCGATGCAATTGGACTCGAGGAGAGCGTTGT  
CTTGGAGGACAGGGATAGATCAGAGCTTAGCCGCTGCTGTCTACAACAGGTG  
CGAGGGCAGACACCATACCAACCACATCAACTAATAG

SEQ ID NO 45 (HCCL64)

ATGGTGGCGGGGGCCATTGGGAGTCCTGGCGGGCTCGCCTACTATTCCATGGTGG  
GGAACTGGCTAAGGTTGGTGTGATGCTACTCTTGCCGGCGTCACGGGCATAC  
CCGCGTGTCAAGGAGGGCAGCAGCCTCCGATACCAGGGCCTGTGTC  
CCCGGGTCGGCTCAGAAAATCCAGCTCGTAAACACCAACGGCAGTGGCACATCAAC  
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ACAAACACAAATTCAACTCGTCTGGATGCCAGAGCGCTTGGCAGCTGTC  
CGACAAAGTCGCTCAGGGTGGGTCCACTTACACTGAGCCTAACAGCTCGGAC  
CAGAGGCCACTGCTGGCACTACGCGCCTGACC GTGTGGTATTGTACCC  
AGGTGTGGTCCAGTGTATTGCTTACCCCCAGGCCCTGTTGGTGGGACGAC  
TCGGTTGGTGTCCCCACGTATAACTGGGGCGAACGACTCGGATGTGCTGATT  
AACAAACACGCGGCCGCCGAGGCAACTGGTTCGGCTGTACATGGATGAATGG  
GGGTTACCAAGACGTGTGGGGCCCCCGTGCAACATGGGGGGCCGGCAACAAAC  
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CACTACCCCTGCACTGTCAACTTACCATCTTCAAGGTTAGGATGTACGTGGGGCG



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Fig. 21J

TGGAGCACAGGTTCGAAGCCGCATGCAATTGGACTCGAGGAGAGCGTTGTGACTTGGAG  
GGACAGGGATAGATCAGAGCTTAGCCCGCTGCTGCTGTCTACAAACAGAGTGGCAGATA  
CTGCCCTGTTCTTCAACCACCTGCCGGCCCTATCCACCGGCCTGATCCACCTCCATCA  
GAACATCGTGGACGTGCAATACTGTACGGTGTAGGGTGGCGGTGTCCTCCCTGTC  
ATCAAATGGGAGTATGTCCTGTTGCTCTTCCCTCCTGGCAGACGCGCGCATCTGCGC  
CTGCTTATGGATGATGCTGCTGATAGCTCAAGCTGAGGCCGCTTAGAGAACCTGGTG  
GTCCTCAATGCGCGGCCGTGGCCGGGCGCATGGCACTCTTCCTTGTGTTCTT  
CTGTGCTGCCTGGTACATCAAGGGCAGGCTGGTCCCTGGTGGCATACGCCCTTAT  
GGCGTGTGGCCGCTGCTCCTGCTTCTGCTGGCCTTACCAACCACGAGCTTATGCCTAGTAA

SEQ ID NO 47 (HCCI65)

AATTTGGGTAAGGTATCGATACCCTTACATGCGGCTCGCCGACCTCGTGGGGTACA  
TTCCGCTCGTCGGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGGCGTCCG  
GGTTCTGGAGGACGGCGTGAACTATGCAACAGGGATTGCCCCGTTGCTCTTCTCT  
ATCTTCCCTTGGCTTGCTGCTCTGTGACCGTTCCAGCTTCCGCTTATGAAGTGCG  
CAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTGTAT  
GAGGCAGCGGACATGATCATGCACACCCCCGGGTGCGTGCCCTGCGTTGGGAGAAC  
AACTCTTCCCCTGCTGGTAGCGCTCACCCCCACGCTCGCAGCTAGGAACGCCAGCG  
TCCCCACCACGACAATACGACGCCACGTCGATTGCTCGTTGGGCGGCTGCTTCTG  
TTCCGCTATGTACGTGGGGACCTCTGCGGATCTGTCTCCTCGTCTCCAGCTGTTCA  
CCATCTCGCCTCGCCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATCCC  
CCACATAACGGTCACCGTATGGCTGGATATGATGATGAACGGTGCCTACAACG  
GCCCTGGTGGTATCGCAGCTGCTCCGGATCCCACAAGCTGTCGTGGACATGGTGGCG  
GGGCCATTGGGAGTCCTGGCGGGCTCGCCTACTATTCCATGGTGGGAACGGC  
TAAGGTTTGGTTGTGATGCTACTCTTGCCGGCGTGCACGGCATAACCGCGTGT  
GAGGGCAGCAGCCTCGATACCAGGGCCTGTTGTCCTCTTACGGGCG  
TCAGAAAATCCAGCTGTAACACCAACGGCAGTTGGCACATCAACAGGACTGCC  
GAACGTCAACGACTCCCTCCAAACAGGGTTCTTGCCGACTATTCTACAAACACAAA  
TTCAACTCGTCTGGATGCCAGAGCGCTTGGCCAGCTGTCGCTCCATGACAAGTC  
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CTGCTGGCACTACGCGCCTCGACCGTGTGGTATTGTAACCGCGTCTCAGGTGT  
CCAGTGTATTGCTTACCCCCGAGCCCTGTTGTTGGGACGACCGATCGGTTGGT  
CCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTGATTCTAACAAACACGCG  
CCGCCCGAGGCAACTGGTCGGCTGTACATGGATGAATGGCACTGGTTACCAAGA  
CGTGTGGGGCCCCCGTGCACATGGGGGGCCGGCAACAAACACCTTGACCTG



## Fig. 21K

CCACTGACTGTTTCGGAAGCACCCGAGGCCACCTACGCCAGATCGGGTTCTGGGCC  
CTGGCTGACACCTAGGTGTATGGTCATTACCATATAGGCTCTGGCACTACCCCTGCA  
CTGTCAACTTACCATCTTCAAGGTTAGGATGTACGTGGGGCGTGGAGCACAGGTT  
CGAAGCCGCATGCAATTGGACTCGAGGAGAGCGTTGTGACTTGGAGGACAGGGATAG  
ATCAGAGCTTAGCCCGCTGCTGCTGTACAACAGAGTGGCAGATACTGCCCTGTTCC  
TTCACCACCTGCCGGCCCTATCCACCGGCCTGATCCACCTCCATCAGAACATCGTGG  
ACGTGCAATACCTGTACGGTGTAGGGTCGGCGGTTGTCTCCCTGTCATCAAATGGGA  
GTATGTCCTGTTGCTCTTCCTCTGGCAGACGCGCGCATCTGCGCCTGCTTATGGA  
TGATGCTGCTGATAGCTAAGCTGAGGCCGCCTAGAGAACCTGGTGGTCCTCAATGC  
GGCGGCCGTGGCCGGGGCGCATGGCACTTTCCCTGTGTTCTCTGTGCTGCCT  
GGTACATCAAGGGCAGGCTGGCCCTGGTGGGCATACGCCCTATGGCGTGGCC  
GCTGCTCCTGCTTCTGCTGGCCTTACCAACCACGAGCTTATGCCTAGTAAGCTT

SEQ ID NO 49 (HCCI66)

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CAGGACGTCAAGTTCCCGGGCGGTGGTCAGATCGTTGGTGGAGTTACCTGTTGCCGC  
GCAGGGGCCAGGTTGGGTGTGCGCGCGACTAGGAAGACTTCCGAGCGGTGCAAC  
CTCGTGGGAGGCAGAACCTATCCCCAAGGCTGCCGACCCGAGGGTAGGGCCTGGG  
CTCAGCCCGGGTACCCCTGGCCCTCTCGGCCTAGTTGGGCCCTACAGACCCCCGGCGTAGG  
GCTCCTGTCACCCCGCGCTCTCGGCCTAGTTGGGCCCTACAGACCCCCGGCGTAGG  
TCGCGTAATTGGTAAGGTATCGATAACCTTACATGCGGCTCGCCGACCTCGTGG  
GGTACATTCCGCTCGTGGCGCCCCCTAGGGGGCGCTGCCAGGGCCCTGGCGCATGG  
CGTCCGGTTCTGGAGGACGGCGTGAACATGCAACAGGAATTGCCCCGGTTGCTCT  
TTCTCTATCTTCCCTTGGCTTGCTGTCTGACCGTTCCAGCTTCCGCTTATGAA  
GTGCGCAACGTGTCCGGATGTACCATGTCACGAACGACTGCTCCAACCTCAAGCATTG  
TGTATGAGGCAGCGGACATGATCATGCACACCCCCGGTGCCTGCCCTCGCTGGGA  
GAACAACTCTCCGCTGCTGGTAGCGCTACCCCCACGCTCGCAGCTAGGAACGCC  
AGCGTCCCCACCAACGACAATACGACGCCACGTCGATTGCTCGTTGGGGCGCTGCTT  
TCTGTTCCGCTATGTACGTGGGGACCTCTGCGGATCTGTCTTCCCTCGCTCCAGCTG  
TTCACCATCTGCCCTGCCGGCATGAGACGGTGCAGGACTGCAATTGCTCAATCTATC  
CCGGCCACATAACGGGTACCGTATGGCTGGATATGATGATGAACTGGTGCCTAC  
AACGGCCCTGGTGGTATCGCAGCTGCCGGATCCCACAAGCTGCGTGGACATGGTG  
GCGGGGGCCATTGGGGAGTCCTGGCGGGCCTCGCCTACTATTCCATGGTGGGAACCT  
GGGCTAAGGTTTGGTTGTGATGCTACTCTTGCCGGCGTCACGGGCATACCCGCGT  
GTCAGGAGGGCAGCAGCCTCGATAACCAGGGCCTGTGTCCTCTTAGCCCCGGG



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## Fig. 21L

TCGGCTCAGAAAATCCAGCTCGAAACACCAACGGCAGTTGGCACATCAACAGGACT  
GCCCTGAAC TGCAACGACTCCCTCCAAACAGGGTTCTTGC CGCACTATTCTACAAAC  
ACAAATTCAACTCGTCTGGATGCCAGAGCGCTGGCCAGCTGTCGCTCCATCGACAA  
GTTCGCTCAGGGGTGGGTCCCCTCACTTACACTGAGCCTAACAGCTCGGACCAGAGG  
CCCTACTGCTGGCACTACGCGCCTCGACCGTGTGGTATTGTACCCGCGTCTCAGGTGT  
GCGGTCCAGTGTATTGCTTCACCCCGAGCCCTGTTGGTGGGACGACCGATCGGTT  
TGGTGTCCCCACGTATAACTGGGGGGCGAACGACTCGGATGTGCTGATTCTAACAAAC  
ACGC GGCCCGCGAGGCAACTGGTCGGCTGTACATGGATGAATGGCACTGGTTCA  
CCAAGACGTGTGGGGGCCCCCGTGC AACATCGGGGGGCCGGCAACAAACACCTTGA  
CCTGCCCCACTGACTGTTT CGGAAGCACCCCGAGGCCACCTACGCCAGATGCCGTT  
TGGGCCCTGGCTGACACCTAGGTGTGGTCATTACCCATATAGGCTCTGGCACTAC  
CCCTGCACTGTCAACTTCAACCATCTCAAGGTTAGGATGTACGTGGGGCGTGGAGC  
ACAGGTTCGAAGCCGCATGCAATTGGACTCGAGGAGAGCGTTGTGACTGGAGGACA  
GGGATAGATCAGAGCTTAGCCGCTGCTGCTACAACAGAGTGGCAGATACTGCC  
CTGTTCCCTCACCAACCCCTGCCGGCCCTATCCACCGGCCTGATCCACCTCCATCAGAAC  
ATCGTGGACGTGCAATA CCTGTACGGTGTAGGGCGGTTGTCTCCCTTGTCA  
AATGGGAGTATGTCCTGTTGCTCTCCTCTGGCAGACGCCGCATCTGCCCTGC  
TTATGGATGATGCTGCTGATAGCTCAAGCTGAGGCCGCTTAGAGAACCTGGTGGTCC  
TCAATGCCGGCCGTGGCCGGCGCATGGCACTCTTCCCTGGCAGACGCCGCATCTGGCG  
GCTGCCCTGGTACATCAAGGGCAGGCTGGCCCTGGCGGATACGCCCTATGGCG  
TGTGGCCGCTGCTCCTGCTTCTGCTGGCCTTACCAACCACGAGCTTATGCC TAGTAA



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## Fig. 22

OD measured at 450 nm  
 construct

Fraction	volume	dilution	39 Type 1b	40 Type 1b	62 Type 3a	63 Type 5a
START	23 ml	1/20	2.517	1.954	1.426	1.142
FLOW THROUGH	23 ml	1/20	0.087	0.085	0.176	0.120
1	0.4 ml	1/200	0.102	0.051	0.048	0.050
2			0.396	0.550	0.090	0.067
3			2.627	2.603	2.481	2.372
4			3	2.967	3	2.694
5			3	2.810	2.640	2.154
6			2.694	2.499	1.359	1.561
7			2.408	2.481	0.347	1.390
8			2.176	1.970	1.624	0.865
9			1.461	1.422	0.887	0.604
10			1.286	0.926	0.543	0.519
11			0.981	0.781	0.294	0.294
12			0.812	0.650	0.249	0.199
13			0.373	0.432	0.239	0.209
14			0.653	0.371	0.145	0.184
15			0.441	0.348	0.151	0.151
16			0.321	0.374	0.098	0.106
17			0.525	0.186	0.099	0.108
18			0.351	0.171	0.083	0.090
19			0.192	0.164	0.084	0.087

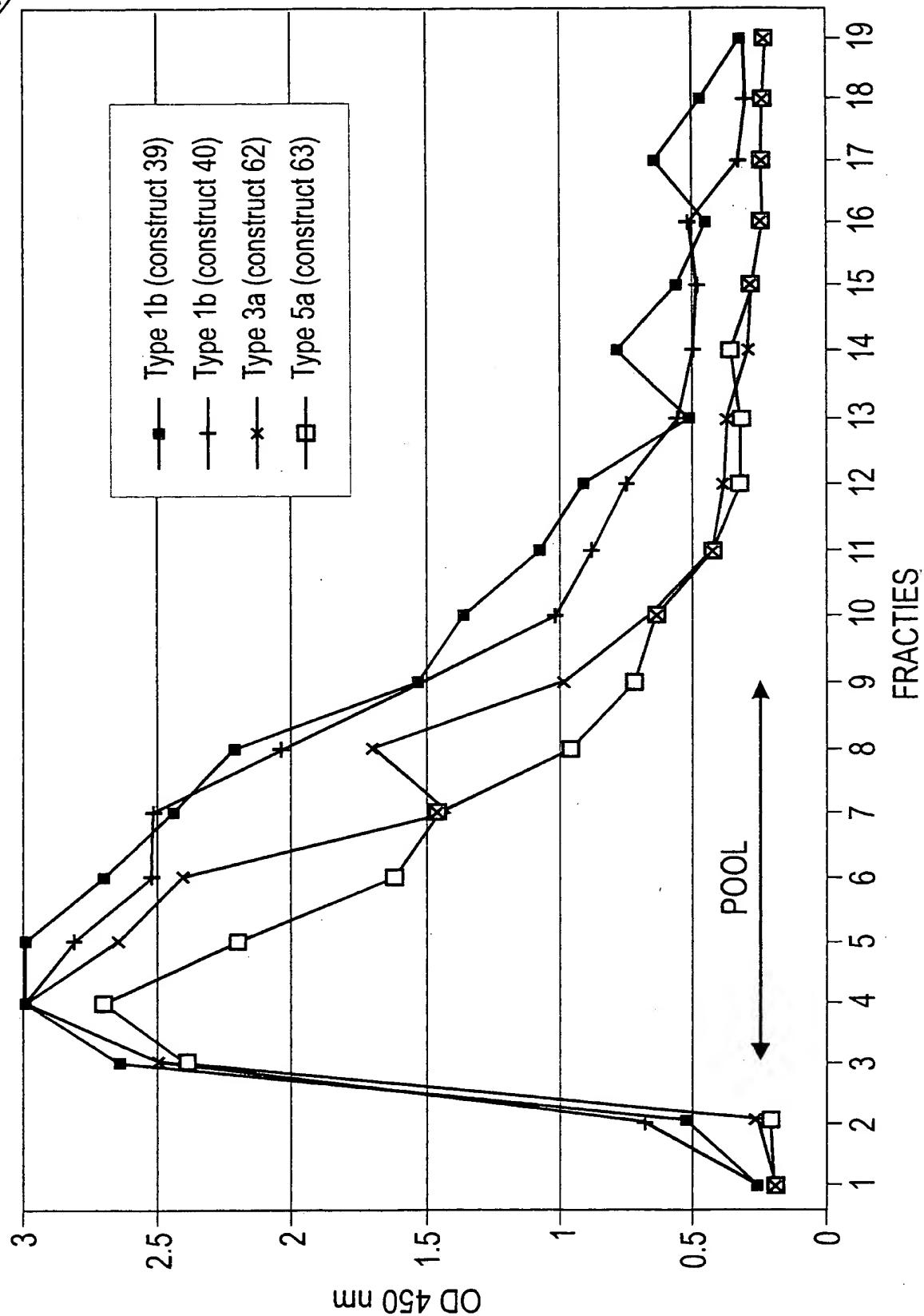


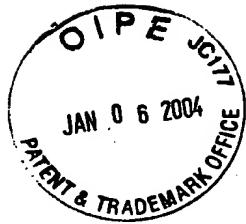
Fig. 23



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## Fig. 24

Fraction	volume	dilution	OD measured at 450 nm			
			construct			
			39 Type 1b	40 Type 1b	62 Type 3a	63 Type 5a
20	250 $\mu$ l	1/200	0.072	0.130	0.096	0.051
21			0.109	0.293	0.084	0.052
22			0.279	0.249	0.172	0.052
23			0.093	0.151	0.297	0.054
24			0.080	0.266	0.438	0.056
25			0.251	0.100	0.457	0.048
26			3	1.649	0.722	0.066
27			3	3	2.528	0.889
28			3	3	3	2.345
29			3	3	2.849	2.580
30			2.227	1.921	1.424	1.333
31			0.263	0.415	0.356	0.162
32			0.071	0.172	0.154	0.064
33			0.103	0.054	0.096	0.057
34			0.045	0.045	0.044	0.051
35			0.043	0.047	0.045	0.046
36			0.045	0.045	0.049	0.040
37			0.045	0.047	0.046	0.048
38			0.046	0.048	0.047	0.057
39			0.045	0.048	0.050	0.057
40			0.046	0.049	0.048	0.049



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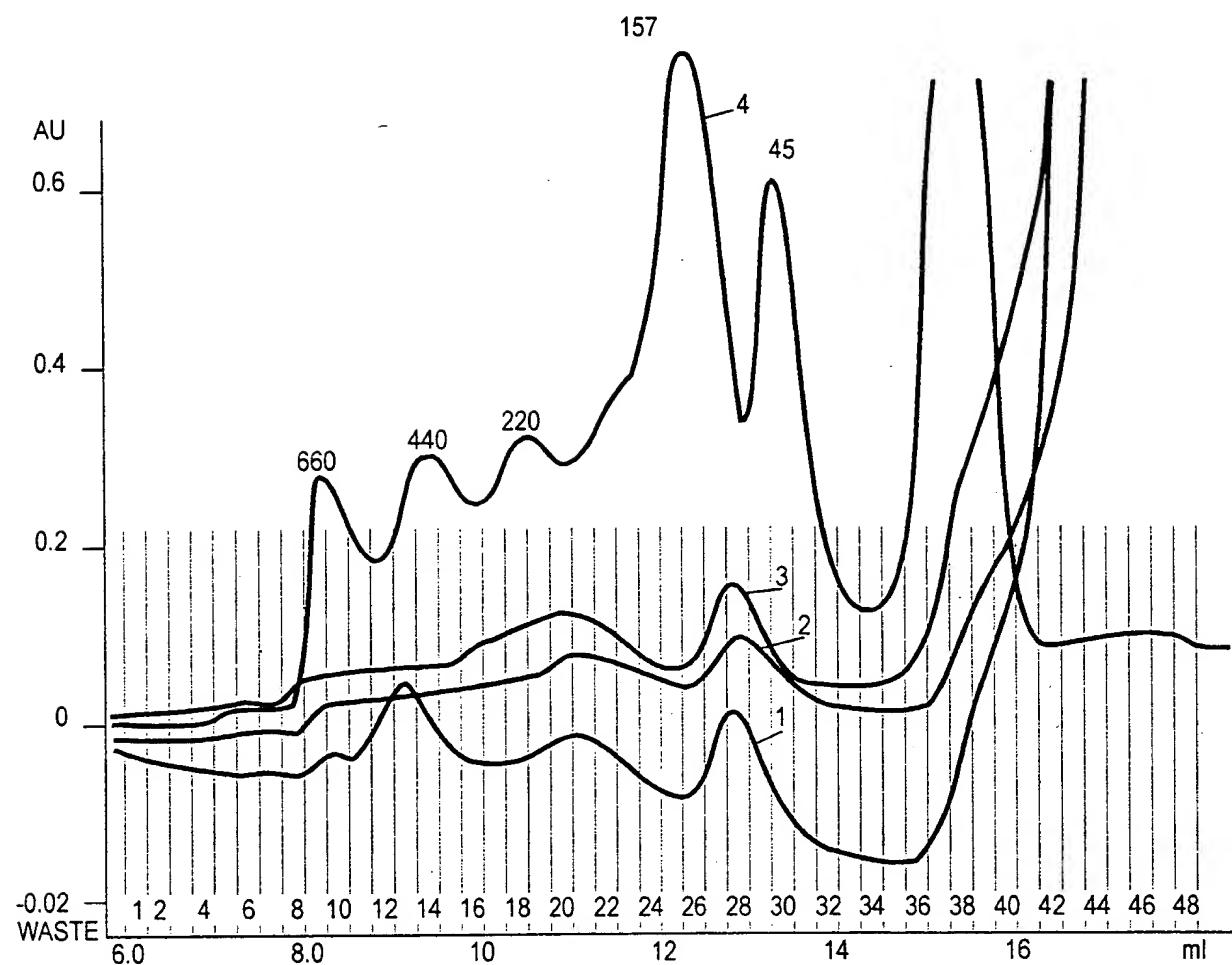


Fig. 25



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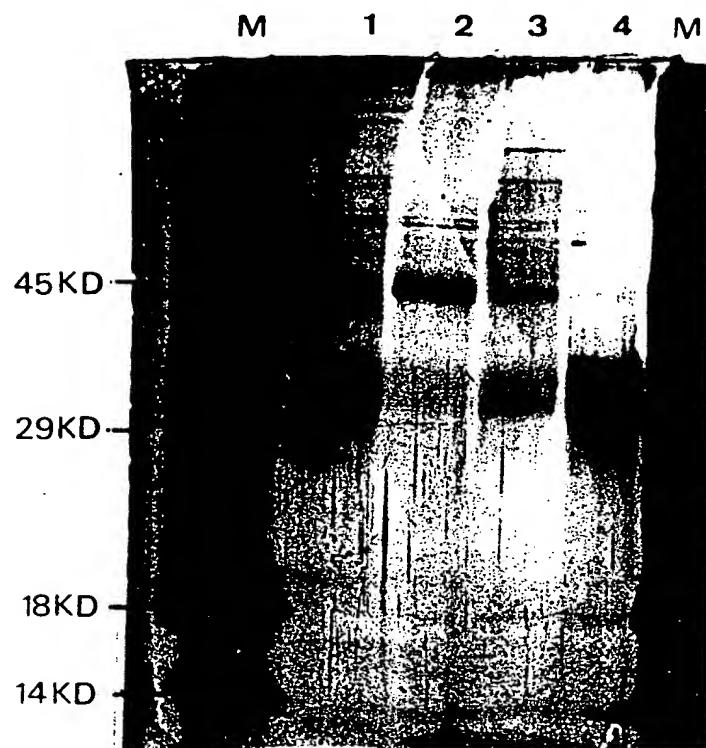


Fig. 26

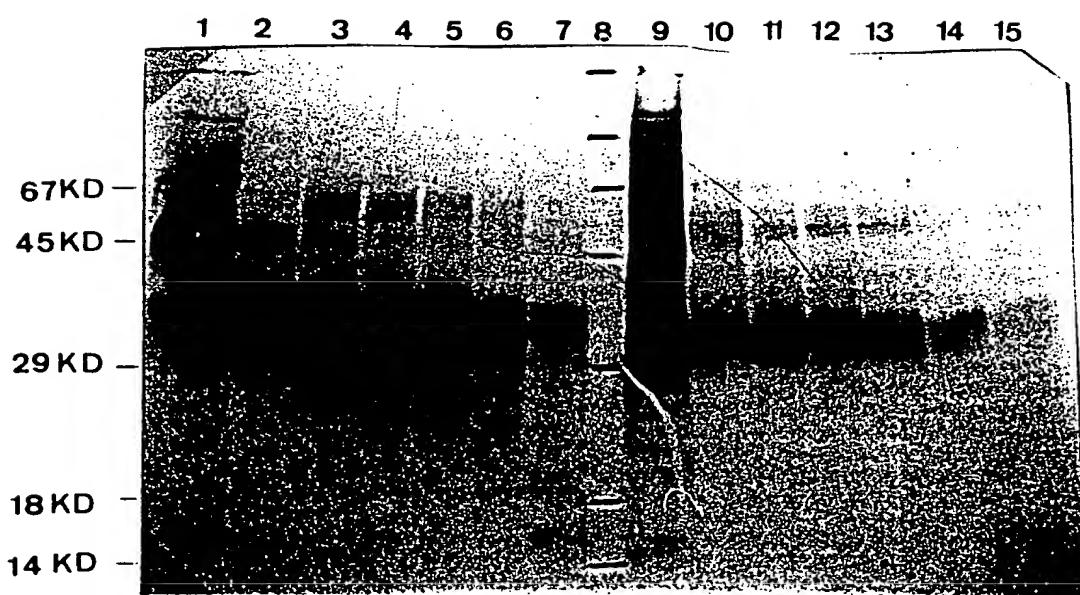


Fig. 27



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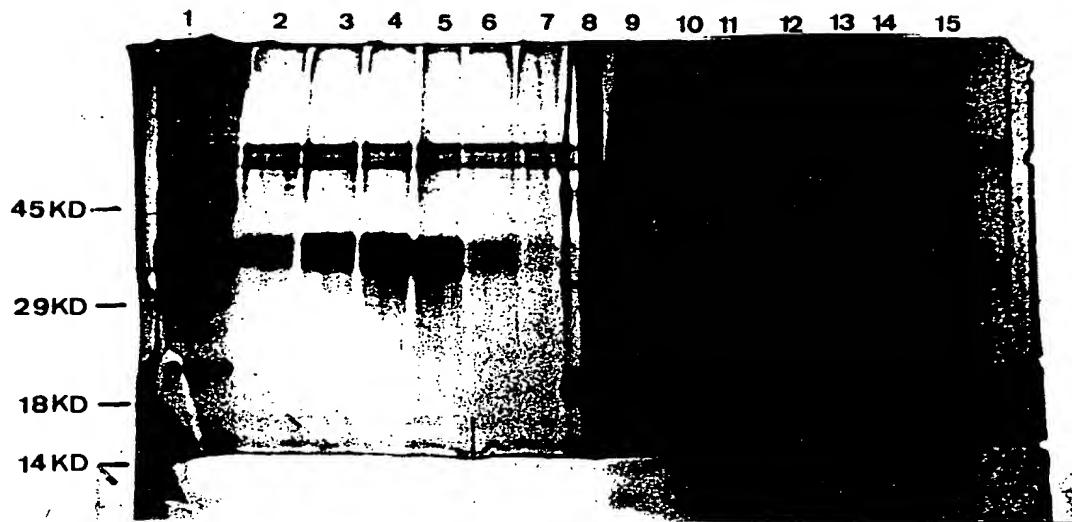
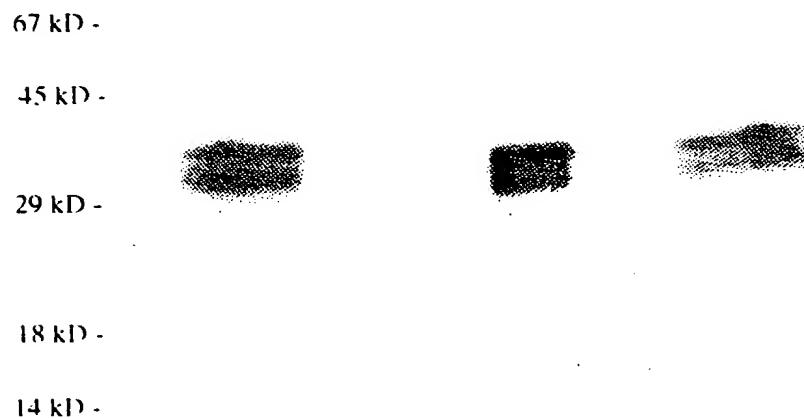


Fig.28

M 1 2 3 4 5 6

Fig.29



- Lane 1: Crude Lysate
- Lane 2: Flow through Lentil Chromatography
- Lane 3: Wash with EMPIGEN Lentil Chromatography
- Lane 4: Eluate Lentil Chromatography
- Lane 5: Flow through during concentration lentil eluate
- Lane 6: Pool of E1 after Size Exclusion Chromatography



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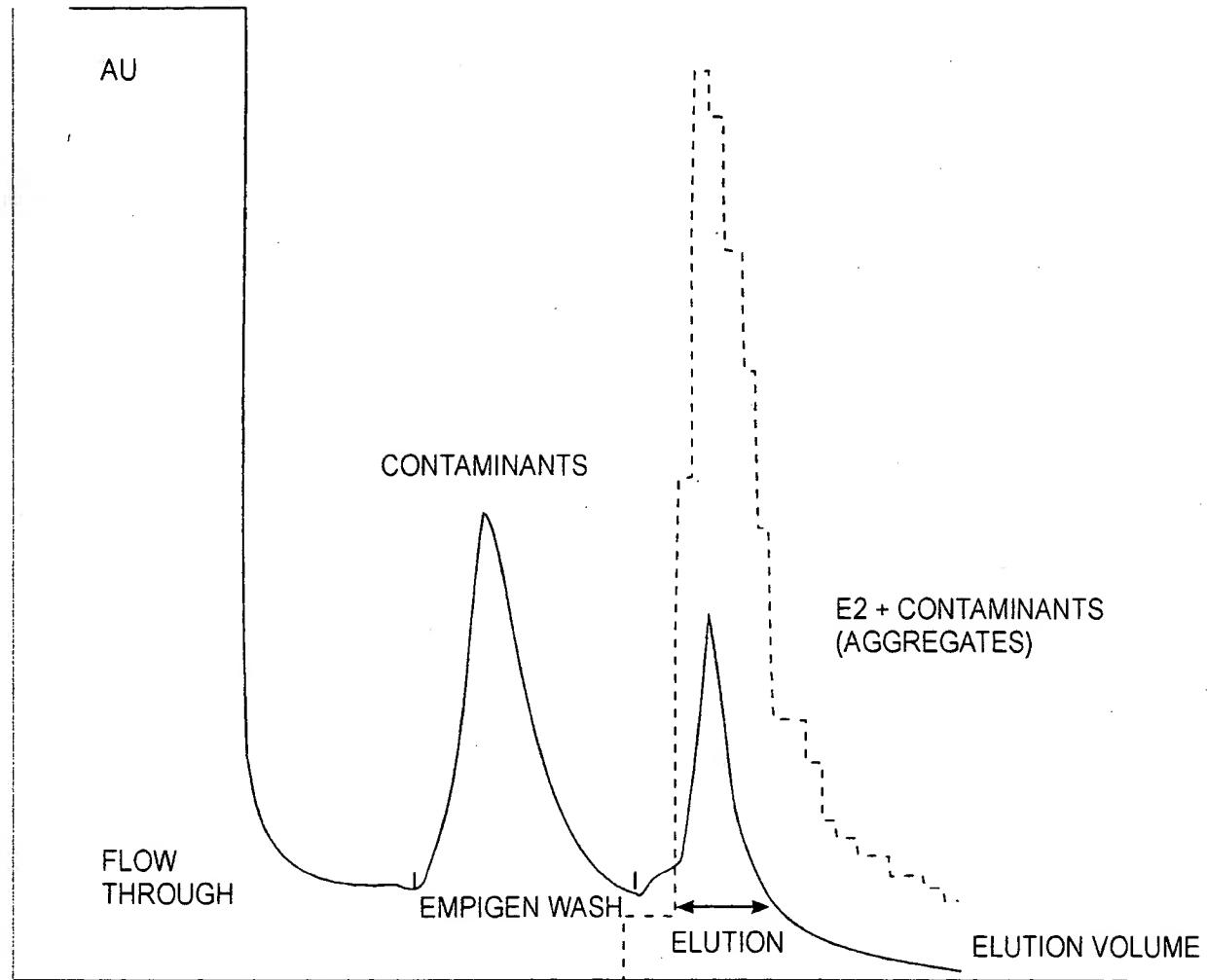


Fig. 30

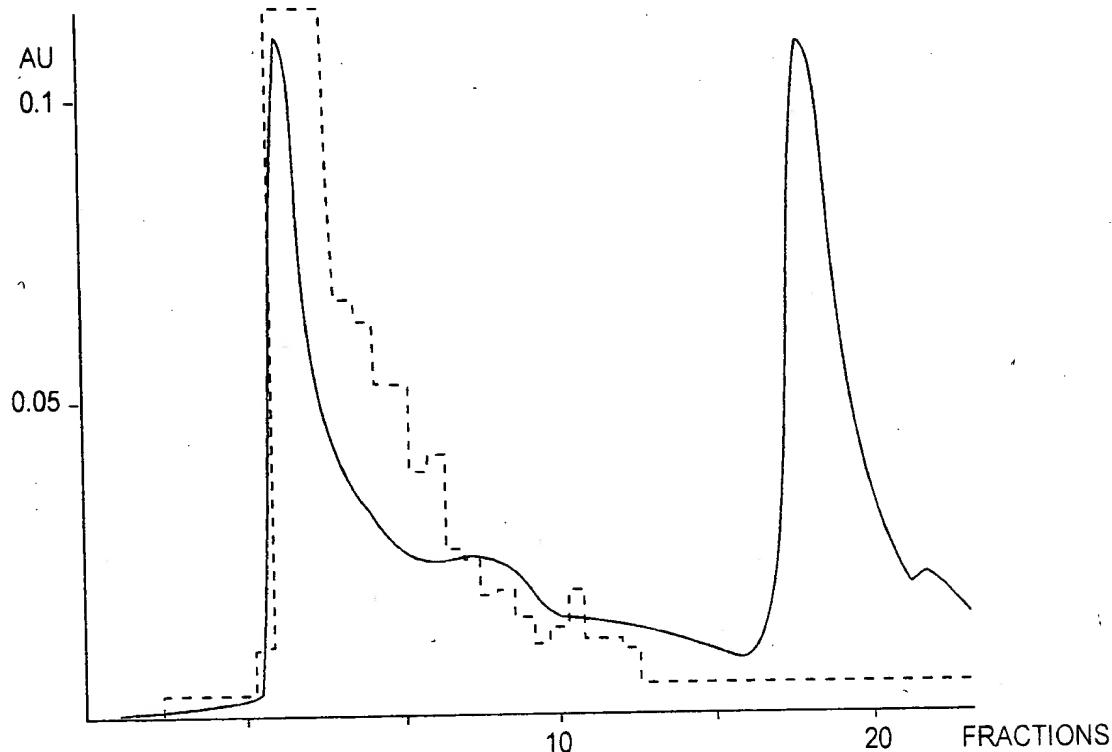


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NON - REDUCED

Fig. 31A

E2 + CONTAMINANTS (AGGREGATES)



REDUCED

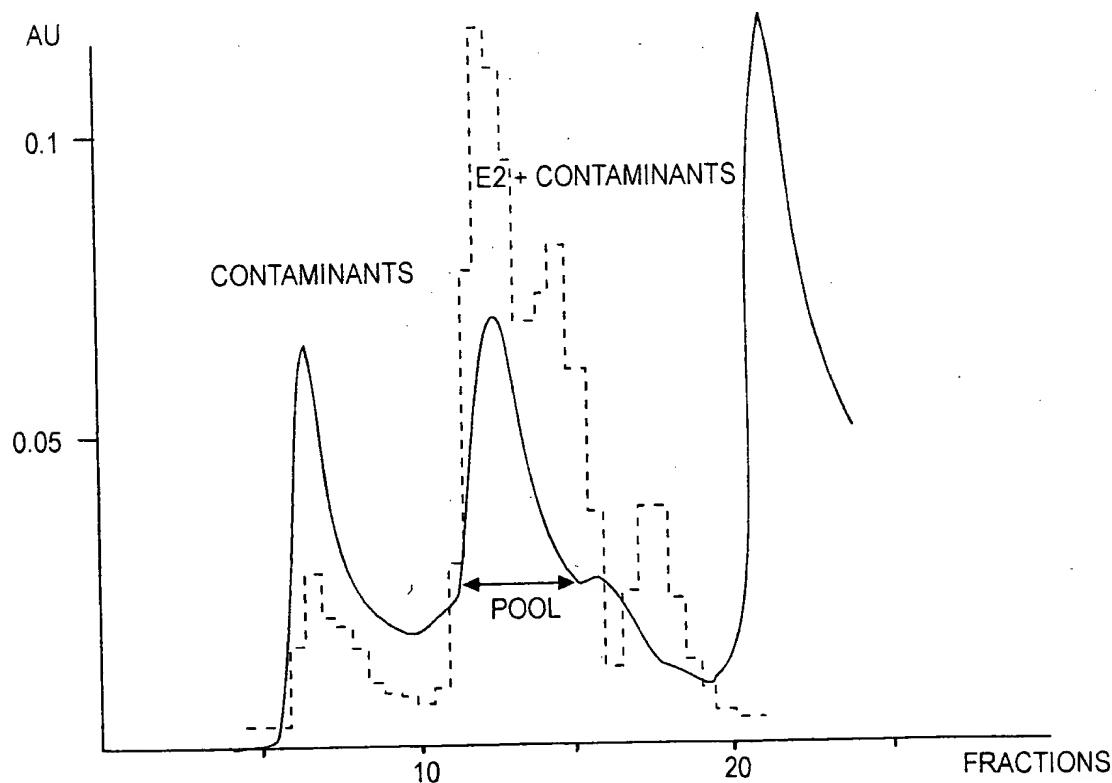


Fig. 31B



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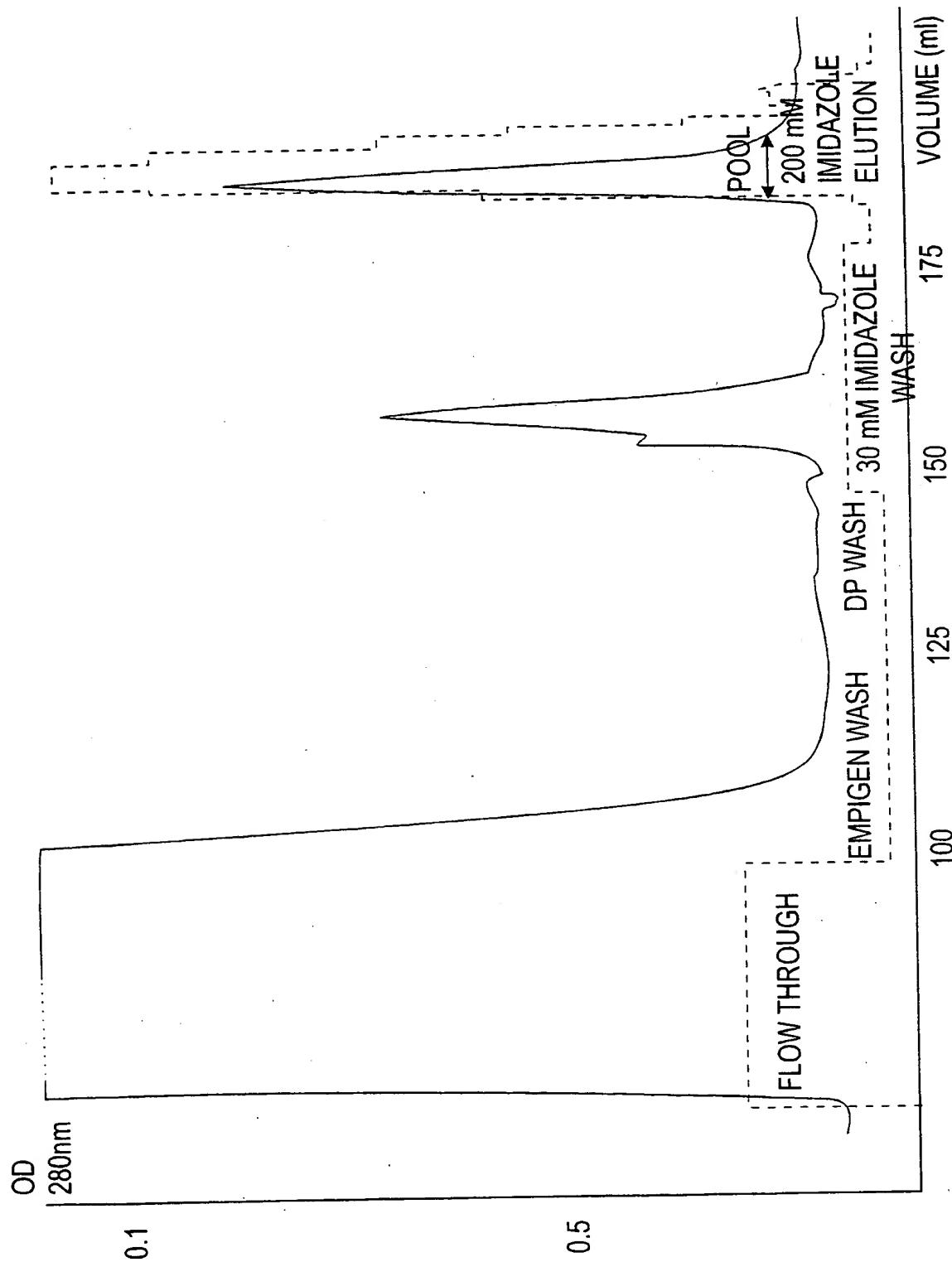
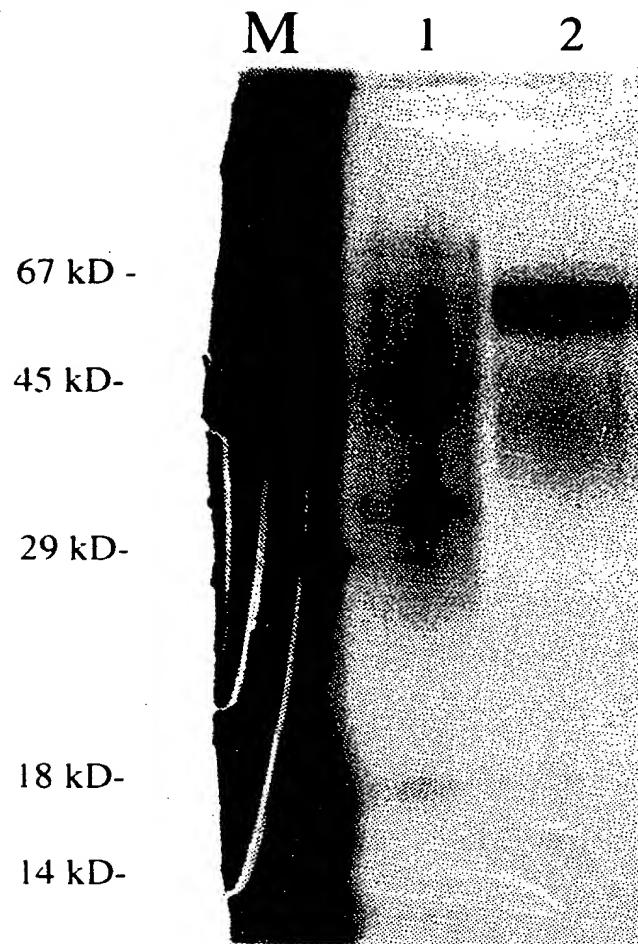


Fig. 32



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## SILVER STAIN OF PURIFIED E2

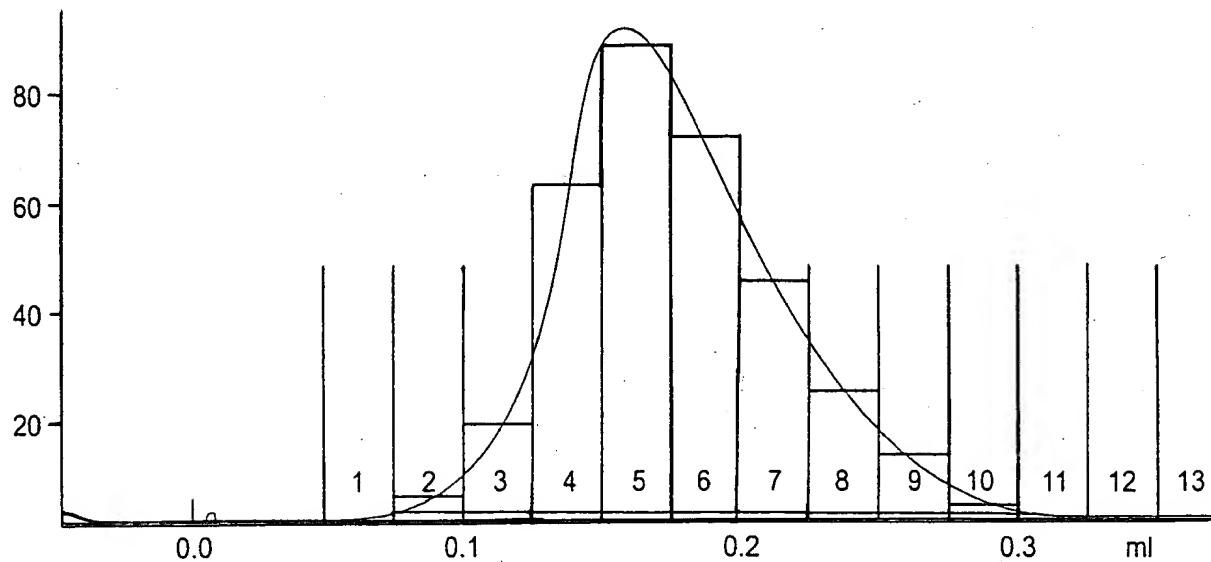


1. 30 mM IMIDAZOLE WASH Ni-IMAC
2. 0.5 ug E2

Fig.33



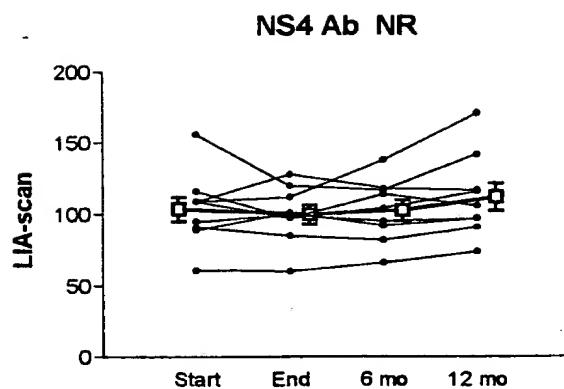
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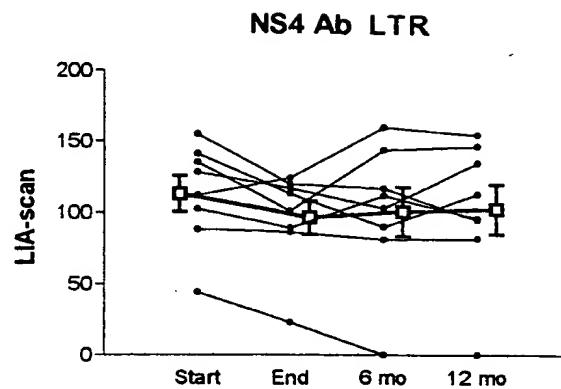
No.	Ret. (ml)	Peak start (ml)	Peak end (ml)	Dur (ml)	Area (ml*mAU)	Height (mAU)
1	-0.45	-0.46	-0.43	0.04	0.0976	4.579
2	1.55	0.75	3.26	2.51	796.4167	889.377
3	3.27	3.26	3.31	0.05	0.0067	0.224
4	3.33	3.32	3.33	0.02	0.0002	0.018

Total number of detected peaks = 4  
 Total Area above baseline = 0.796522 ml\*AU  
 Total area in evaluated peaks = 0.796521 ml\*AU  
 Ratio peak area / total area = 0.999999  
 Total peak duration = 2.613583 ml

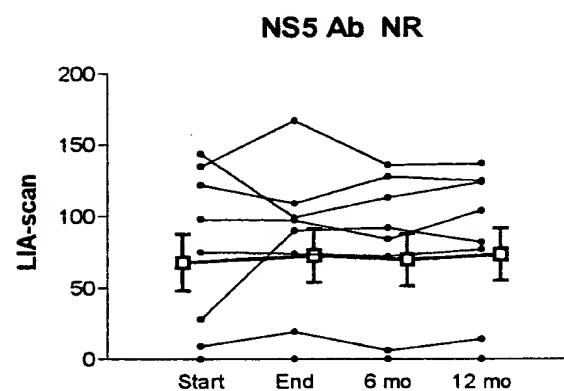
Fig. 34



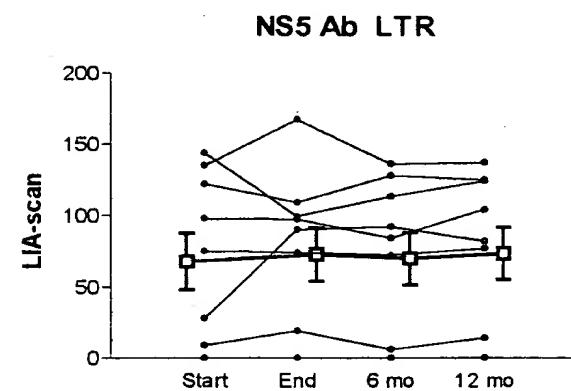
**Fig. 35A-1**



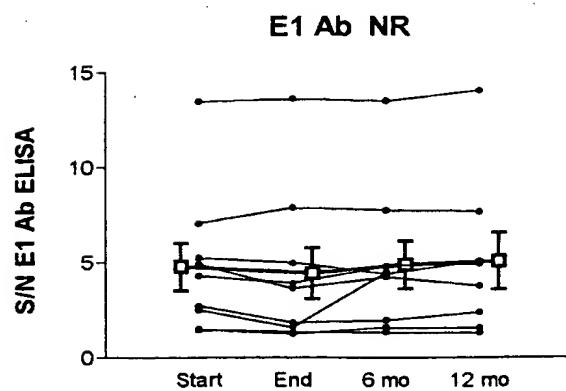
**Fig. 35A-2**



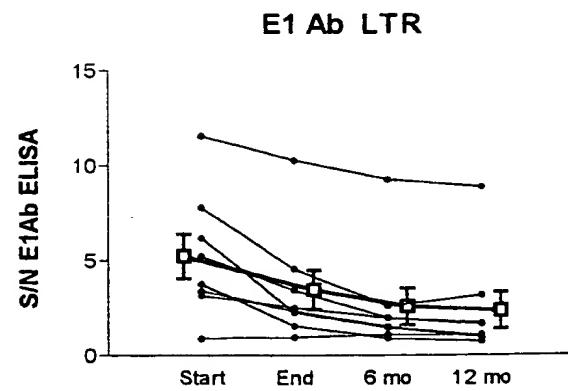
**Fig. 35A-3**



**Fig. 35A-4**



**Fig. 35A-5**



**Fig. 35A-6**



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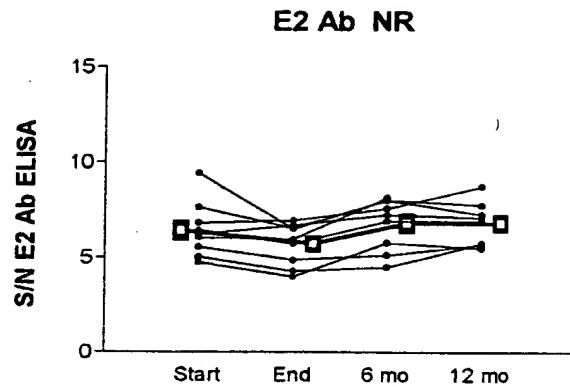


Fig. 35A-7

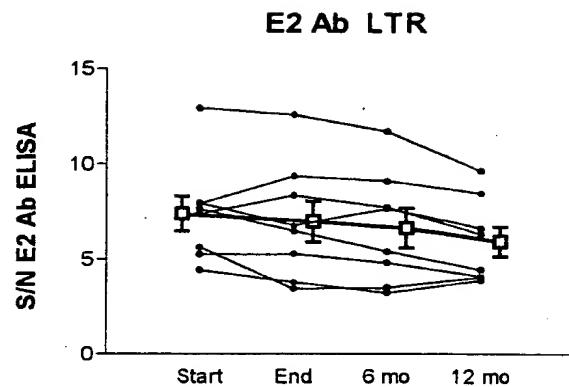


Fig. 35A-8

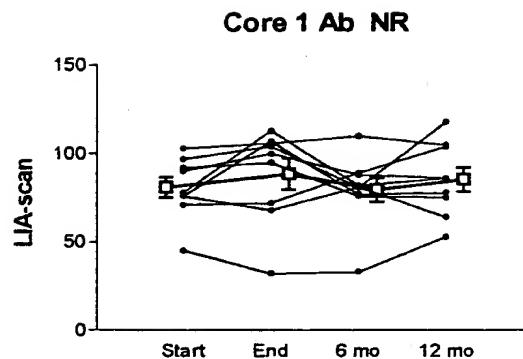


Fig. 35B-1

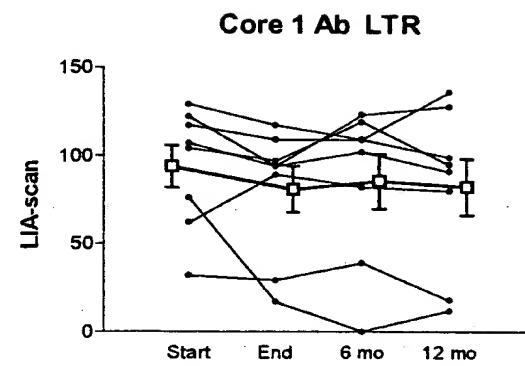


Fig. 35B-2

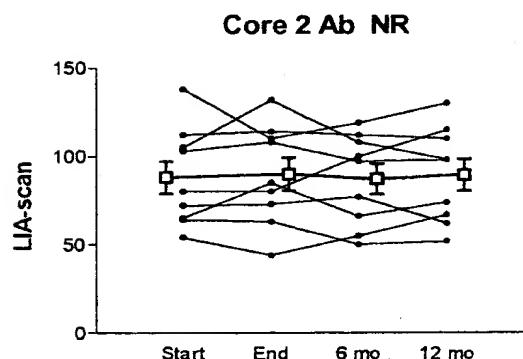


Fig. 35B-3

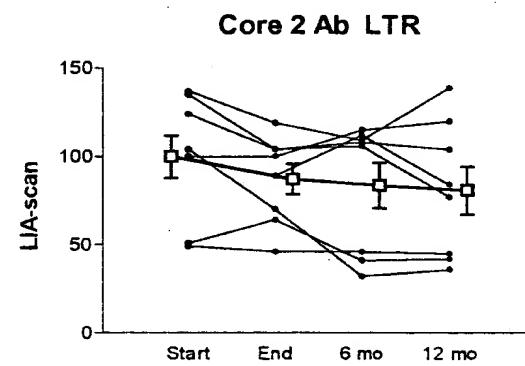


Fig. 35B-4

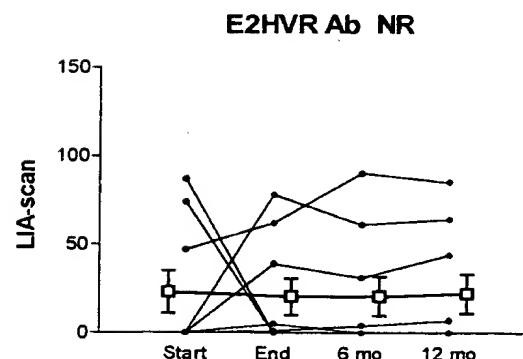


Fig. 35B-5

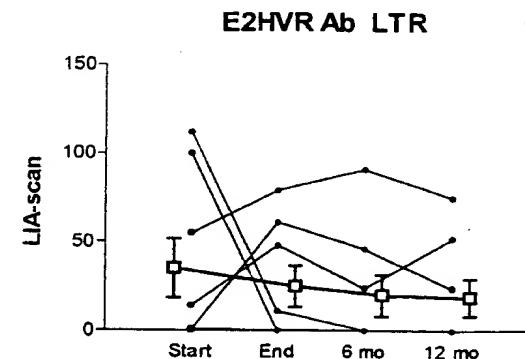
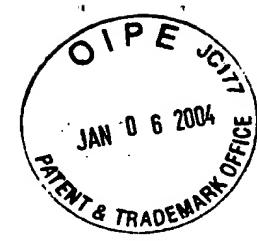


Fig. 35B-6



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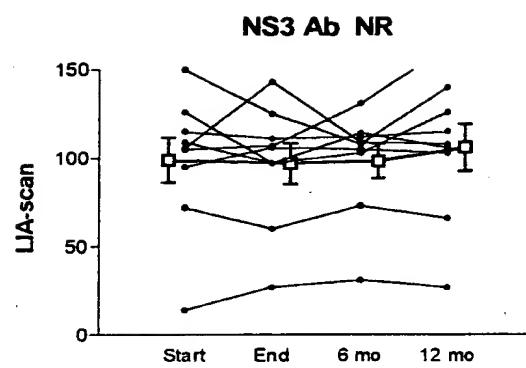


Fig. 35B-7

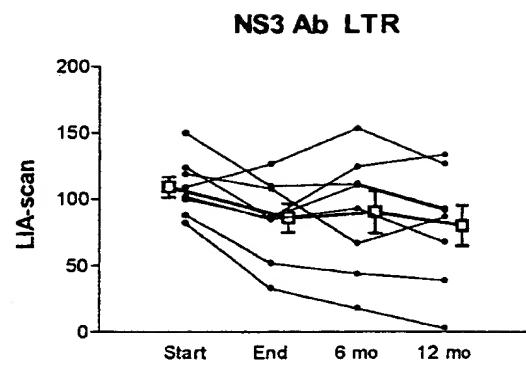


Fig. 35B-8



Fig. 36A

**E1 Ab**

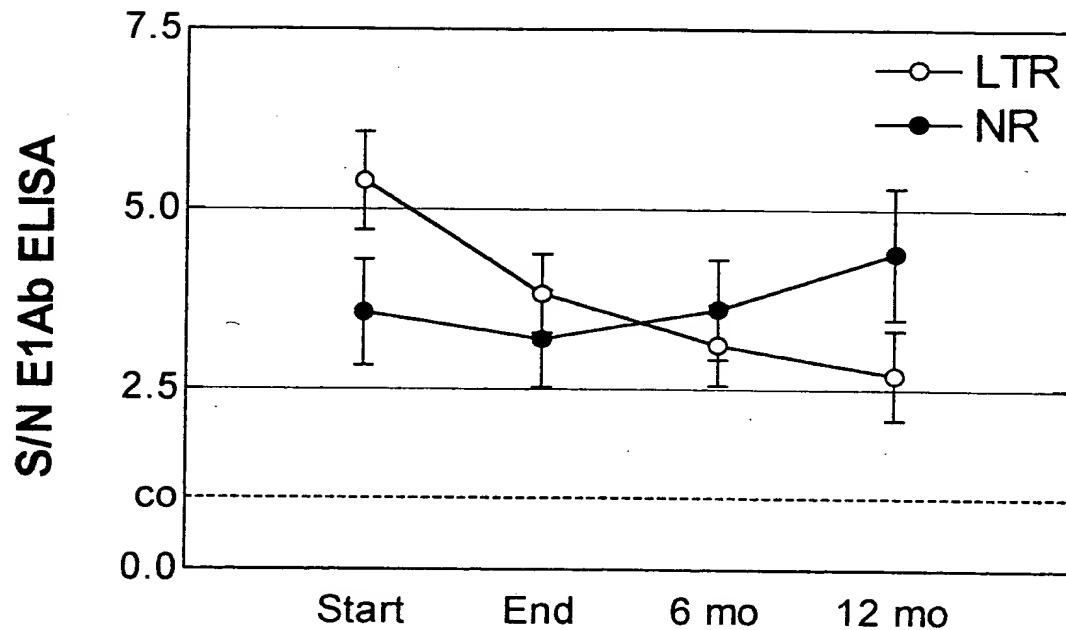
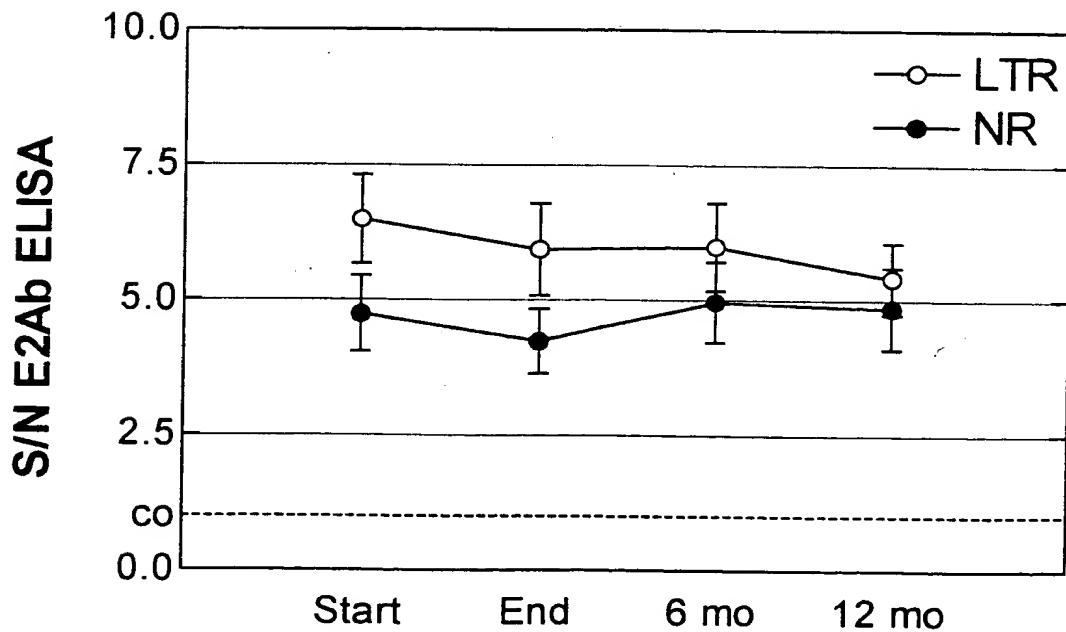


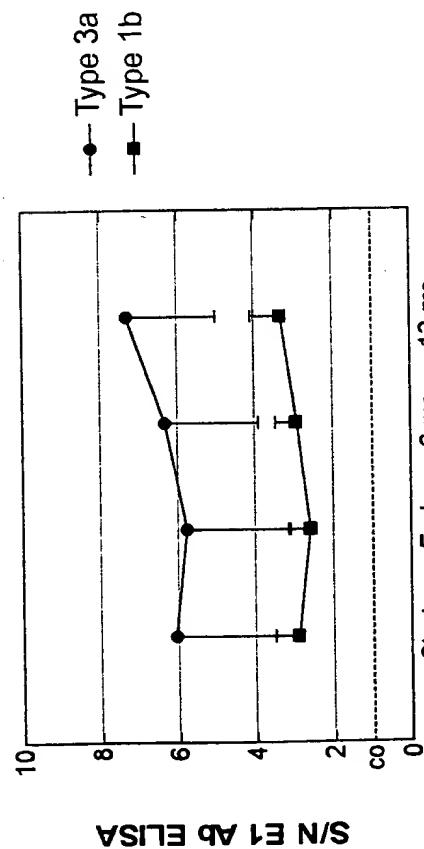
Fig. 36B

**E2 Ab**

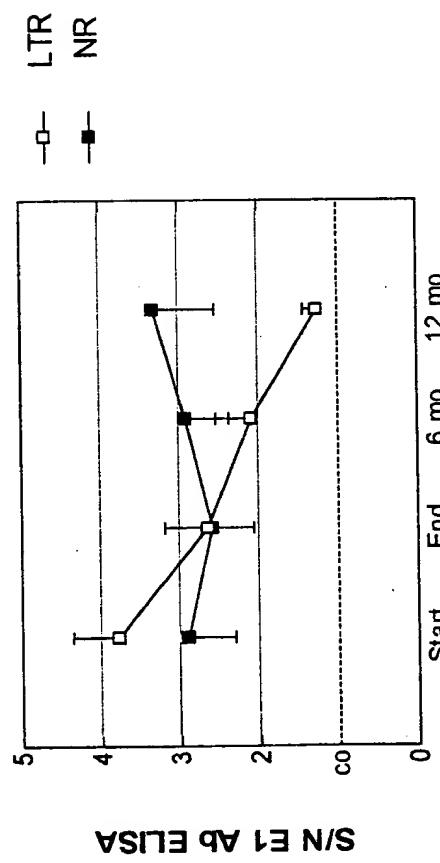




**Fig. 37A**  
**Non Responders**

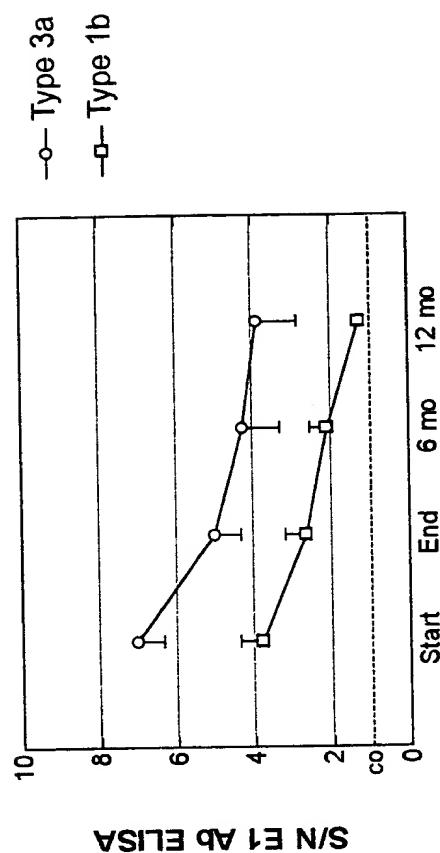


**Fig. 37C**  
**Type 1b**

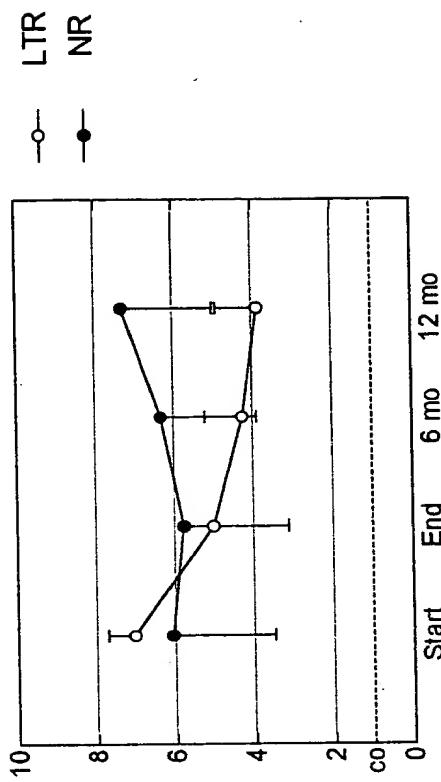


S/N E1 AB ELSA

**Fig. 37B**  
**Long Term Responders**



**Fig. 37D**  
**Type 3a**



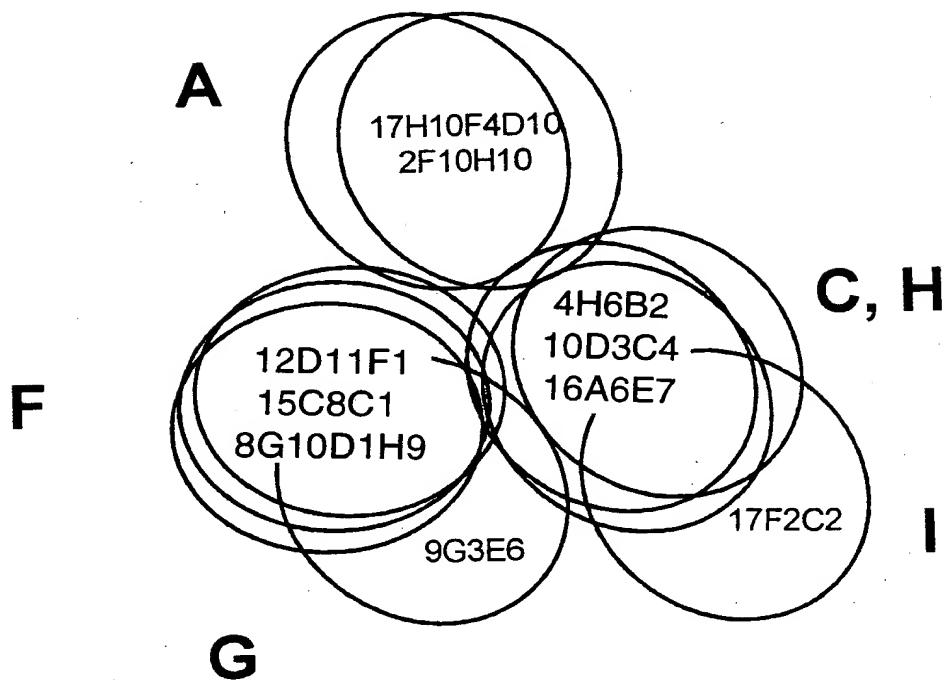
S/N E1 AB ELSA



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Fig. 38

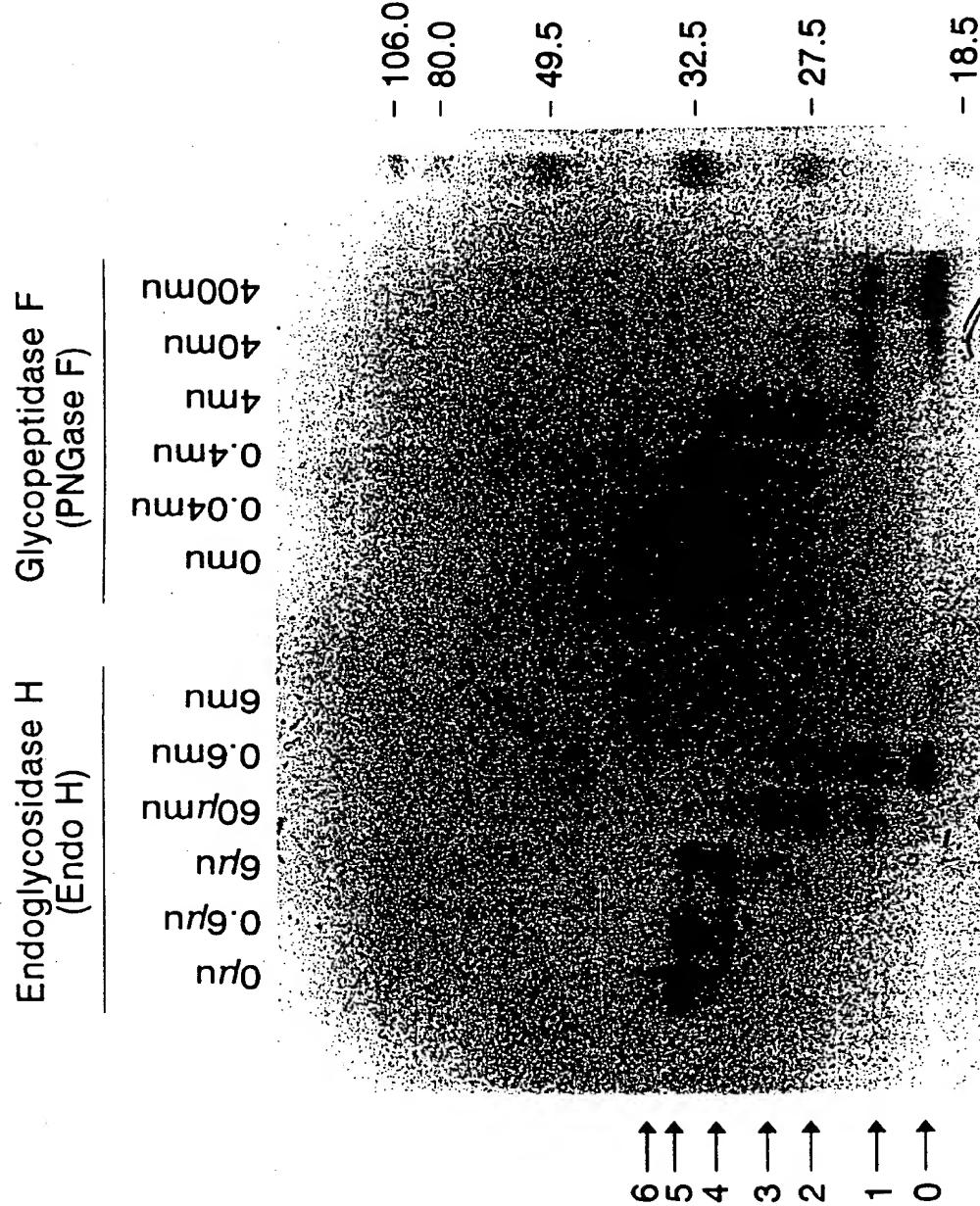
Relative Map Positions of  
anti-E2 monoclonal antibodies





## PARTIAL DEGLYCOSYLATION OF HCV E1 ENVELOPE PROTEIN

Fig.39





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## PARTIAL TREATMENT OF HCV E2/E2s ENVELOPE PROTEINS BY PNGase F

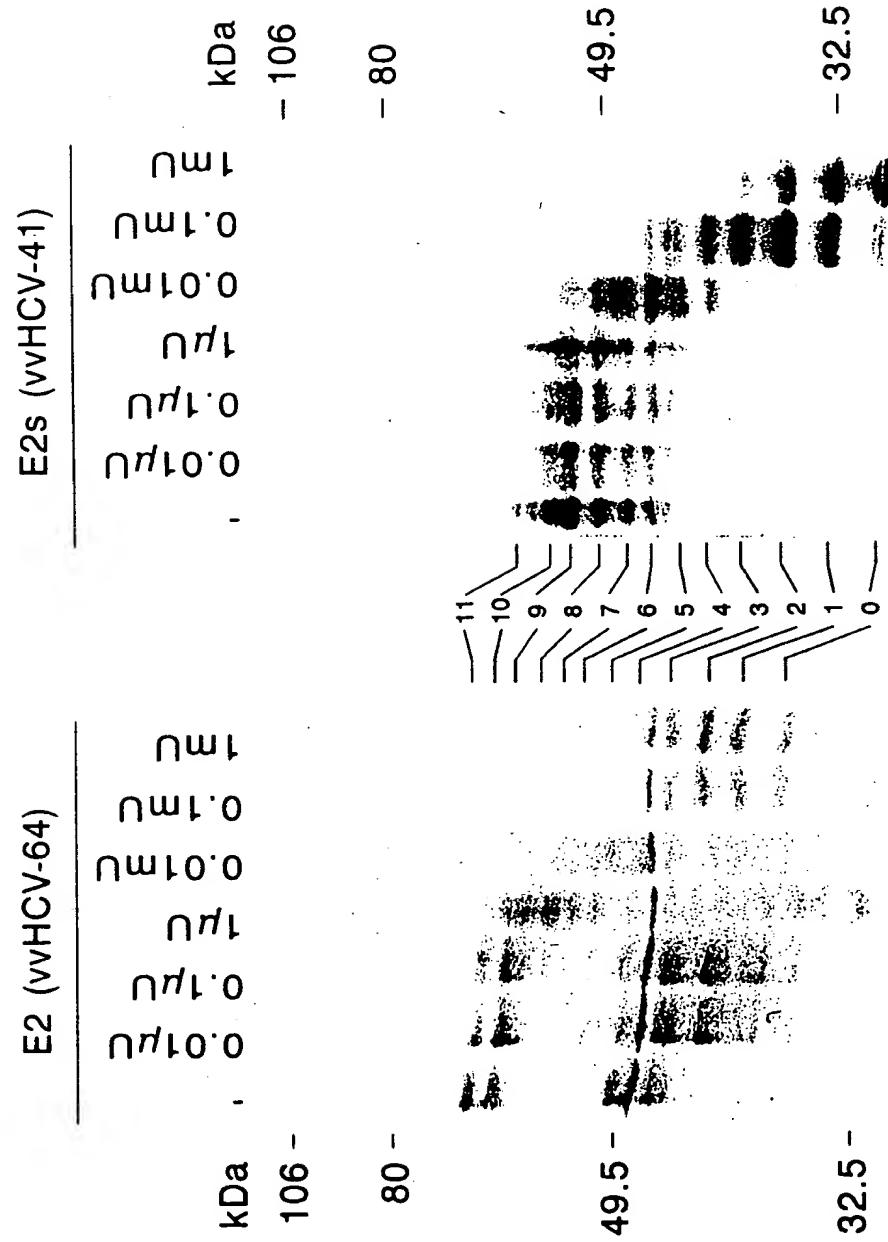
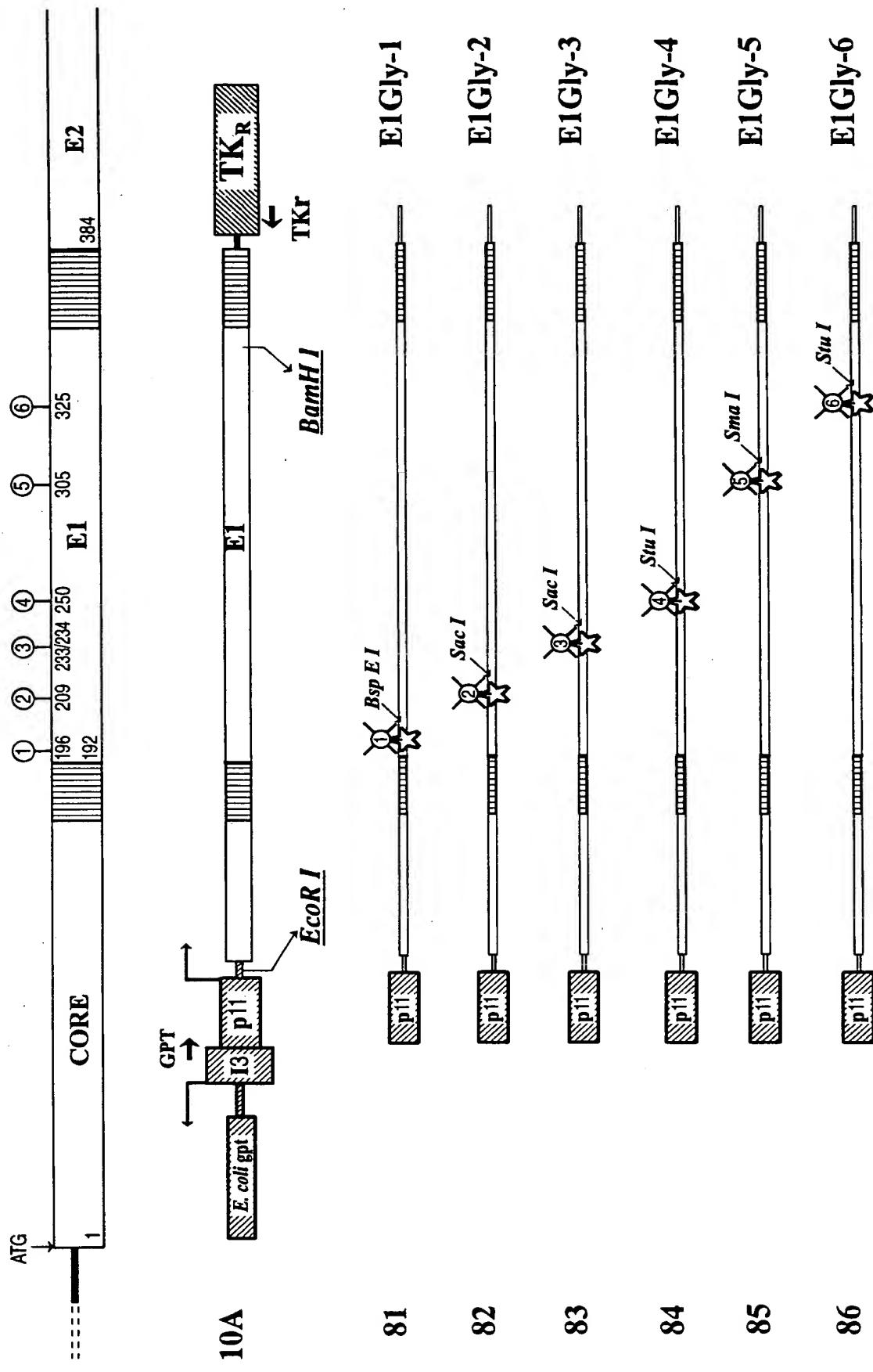


Fig. 40



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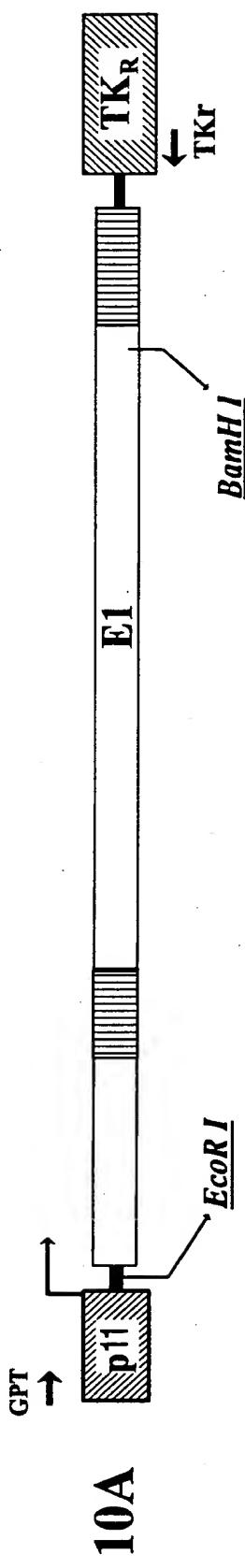
**Fig. 41 *In Vitro* Mutagenesis of HCV E1 glycoprotein**



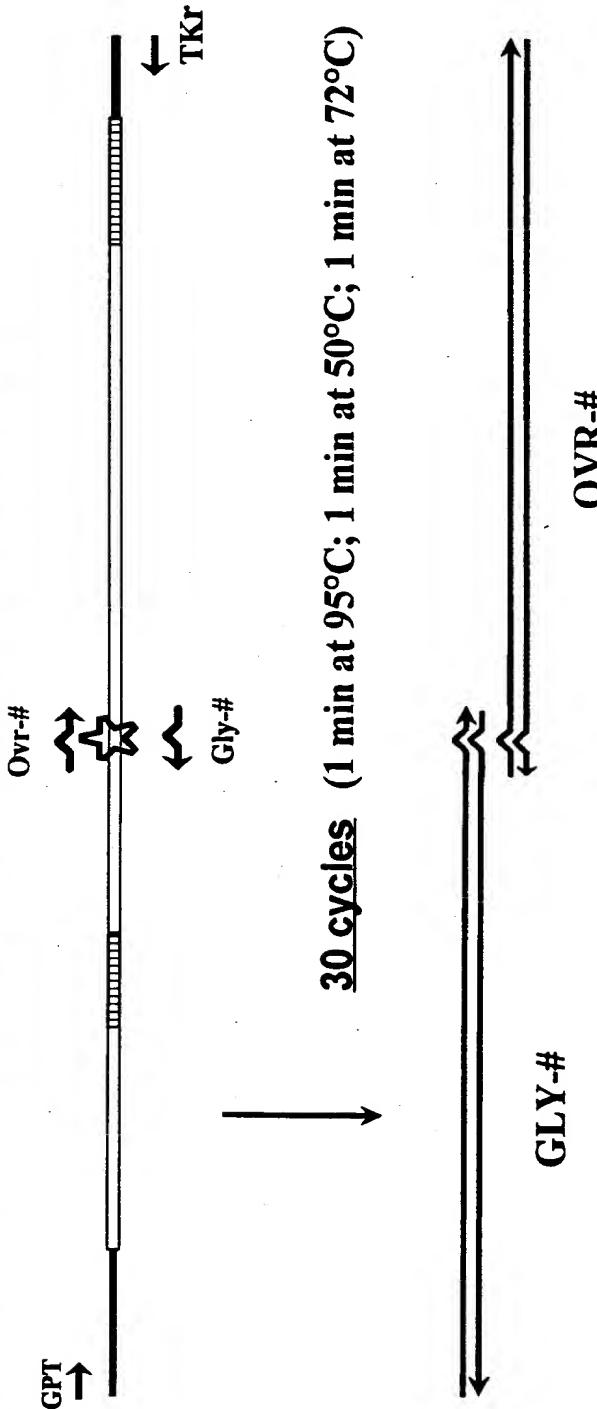


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**Fig. 42A *In Vitro* Mutagenesis of HCV E1 glycoprotein**



**1. First step of PCR amplification (Gly-# and Ovr-# primers)**





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## 2. Overlap extension and nested PCR

### a. Overlap extension

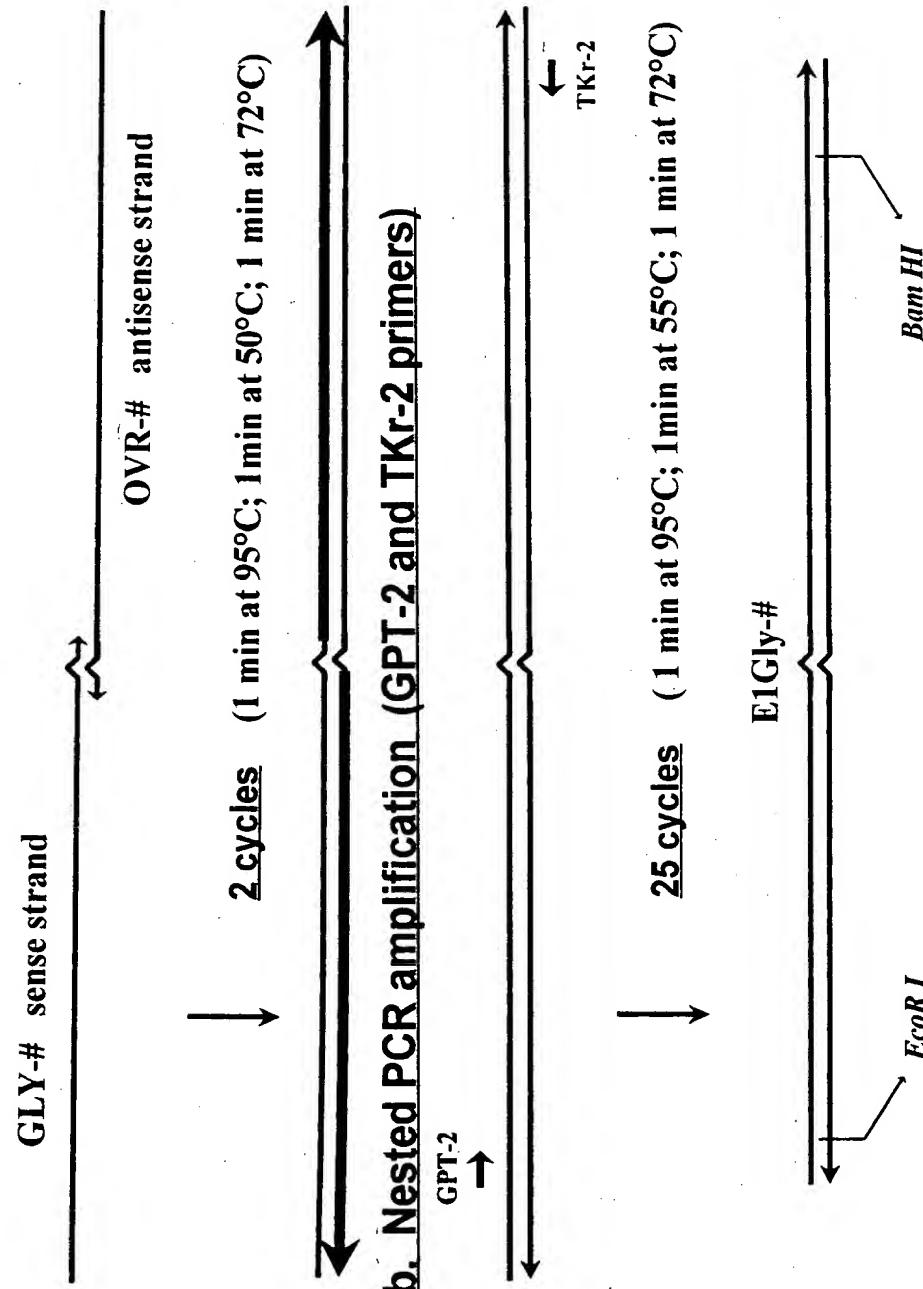
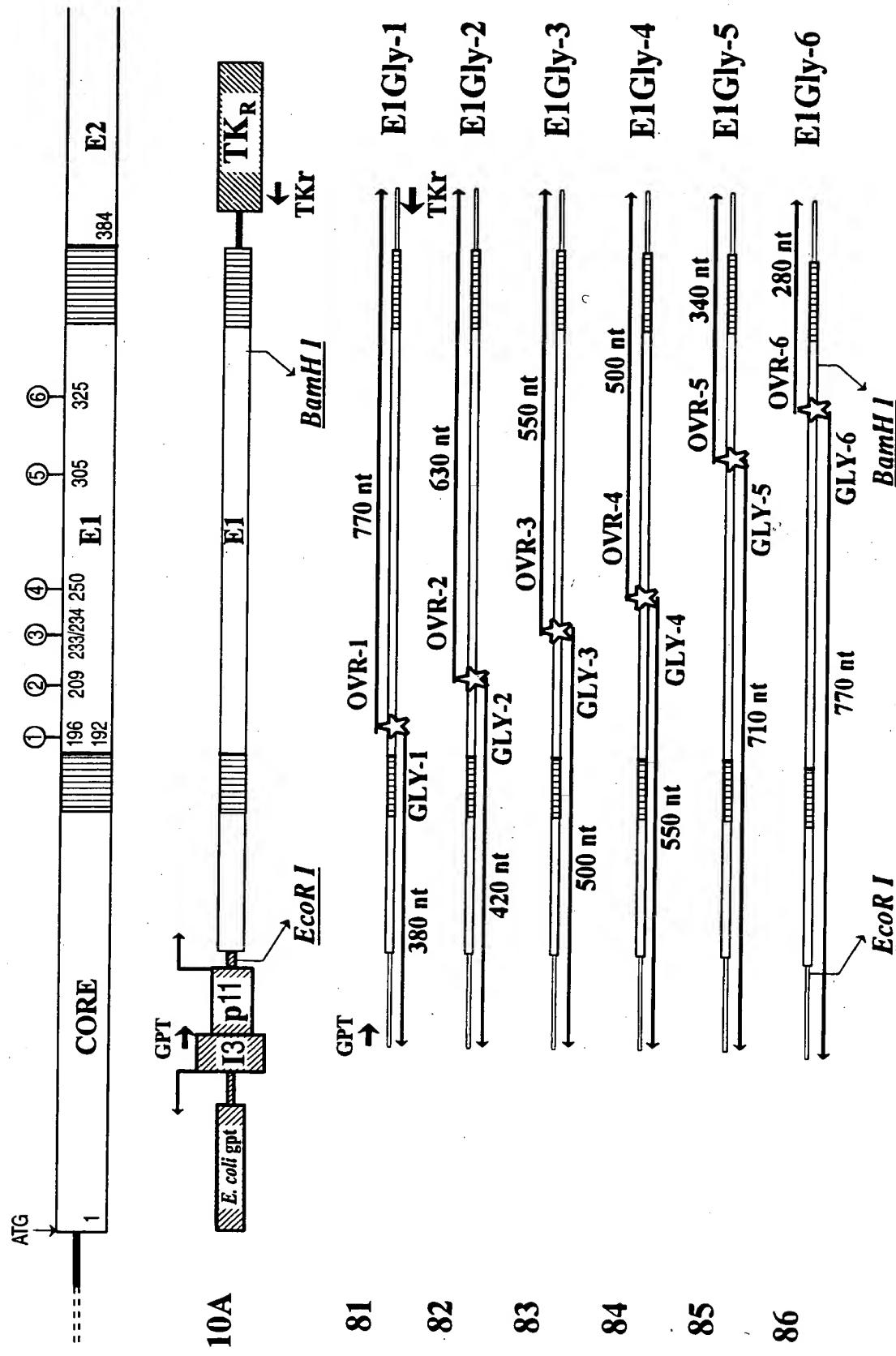


Fig. 42B



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Fig. 43 *In Vitro* Mutagenesis of HCV E1 glycoprotein





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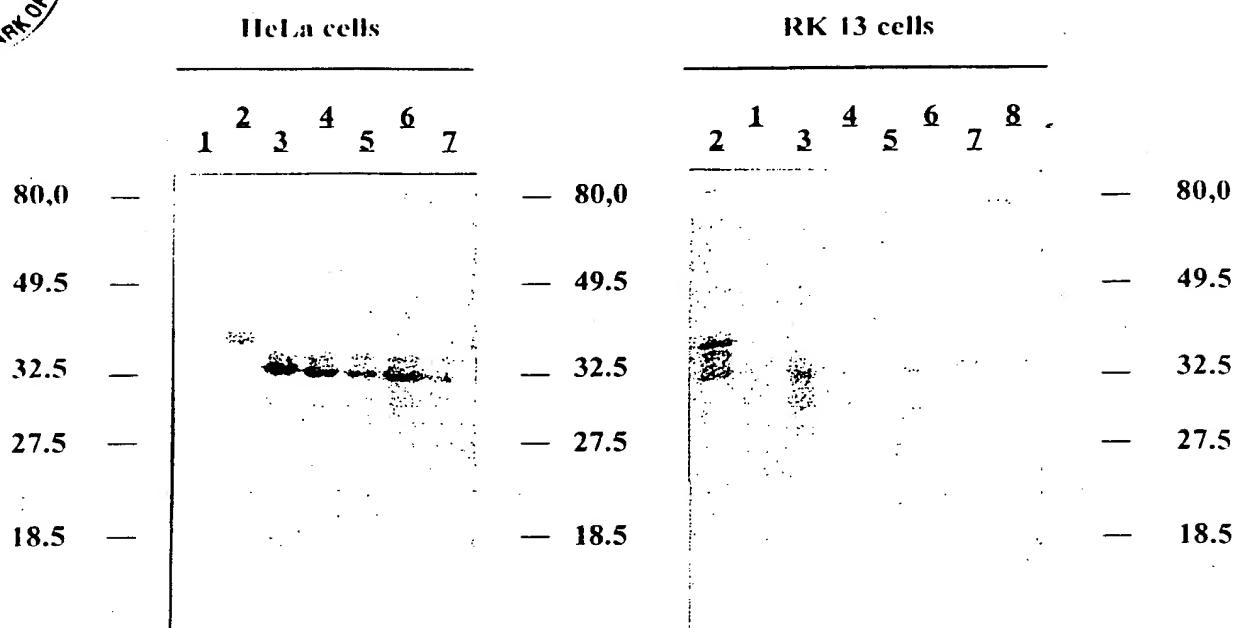


Fig. 44A



Fig. 44B



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Fig. 45

KDa 19 67 43 29 18  
! ! ! ! !



Fig. 46